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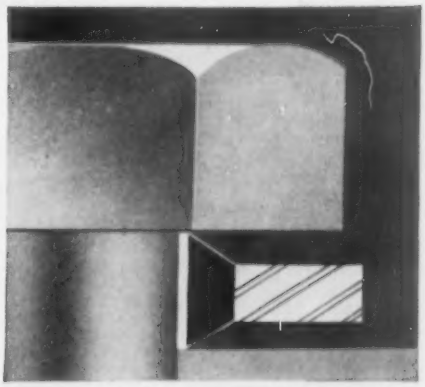
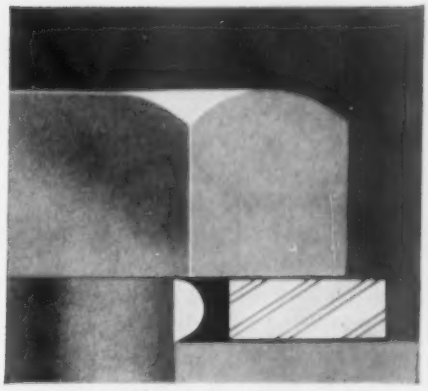


Seal before compression



When bolt is tightened, sealing lips are forced against surface.

Hycar rubber bonded to steel solves sealing problems

FACED by a sealing problem with water, gases, chemicals, petroleum products or other fluids? Then listen to this:—

The Precision Rubber Products Corporation of Dayton, Ohio, has come up with a one-piece seal using Hycar nitrile rubber that gives positive sealing action against constant or pulsating pressures up to 10,000 psi!

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Throughout industry, Hycar's remarkable qualities are improving existing products or are providing the inspiration to create new products. For complete information on how one of the Hycar rubbers can do this for you, too, write Dept. EP-8, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

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West Coast: Harwick Standard Chemical Company, Los Angeles, California.

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Maximum ply width	45"

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2425

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Since changing to PLIOFLEX 1006, the manufacturer of the suits shown reports not one complaint from the field on color or durability. Moreover, he is well pleased with his savings in material and production costs.

Proofed goods is only one of many proved applications for PLIOFLEX rubbers. Its recently much improved color, its excellent physical properties and its ease of processing make it an outstanding candidate for all types of light colored rubber goods—molded, extruded or calendered. Details, samples and the latest *Tech Book Bulletin* on PLIOFLEX are yours by writing to:

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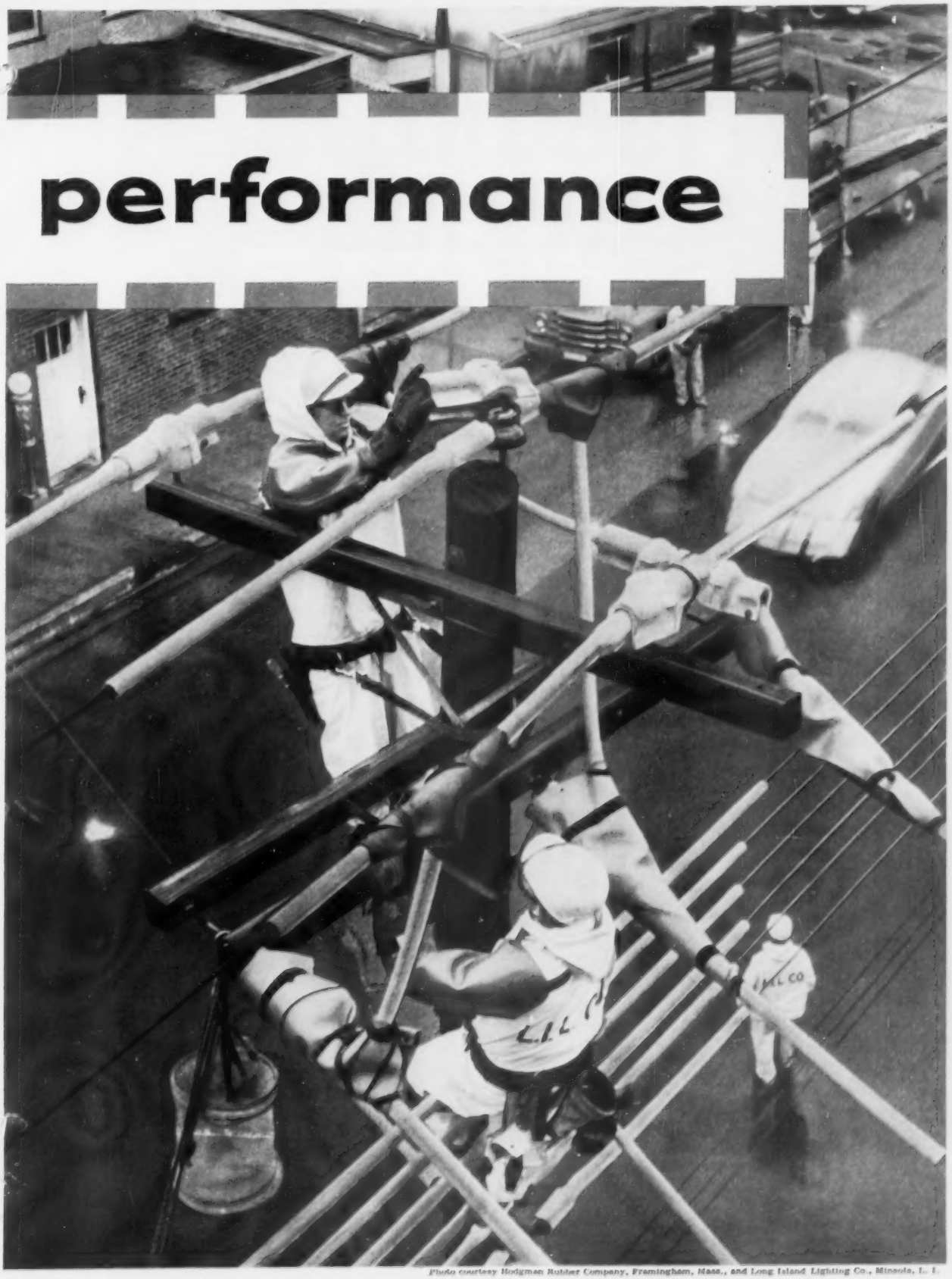

Photo courtesy Hodgman Rubber Company, Framingham, Mass., and Long Island Lighting Co., Mineola, L. I.

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Rubber Age

COVERING THE MANUFACTURE OF RUBBER AND RUBBERLIKE PLASTICS PRODUCTS

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Increasing Service Life of Skiving Knives 802

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*Appears every other month

Microfilm copies of complete volumes of RUBBER AGE are available from: University Microfilms, 313 North First St., Ann Arbor, Mich.

Indexed in Industrial Arts Index and Engineering Index

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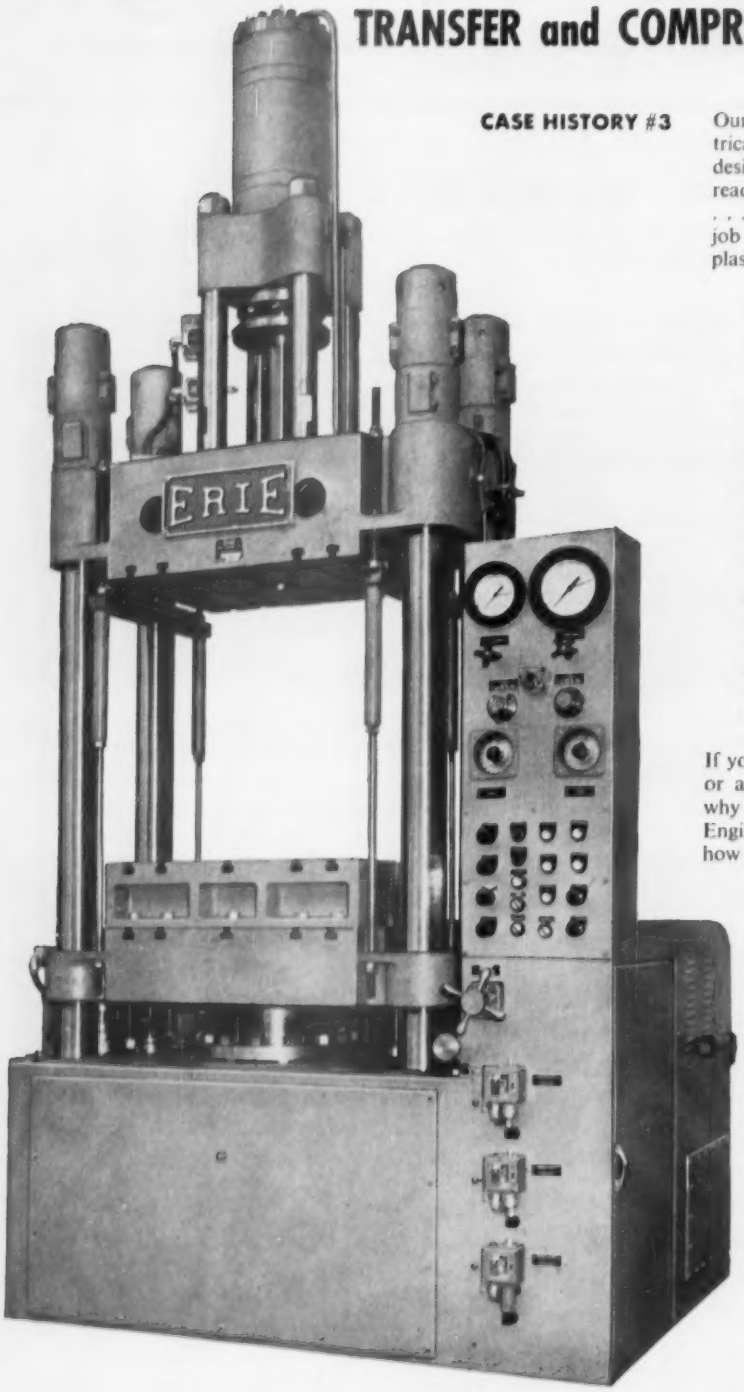

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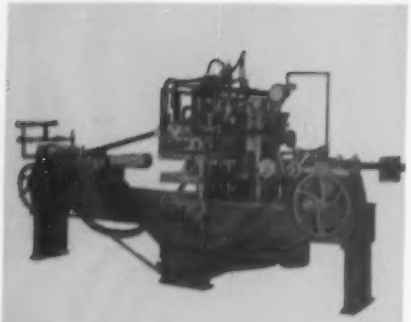
High Polymer Resins, Rubbers, Latices and Related Chemicals for the Process Industries



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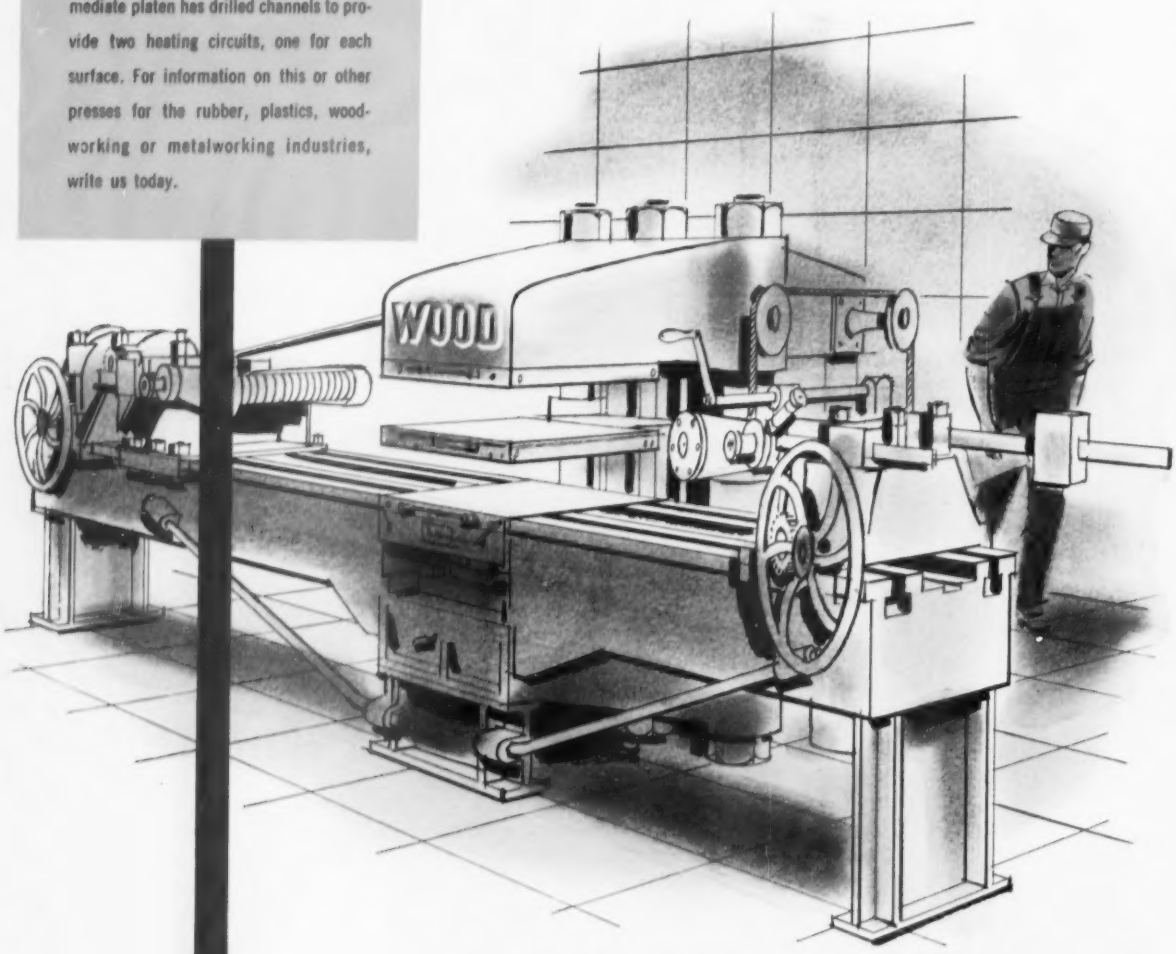

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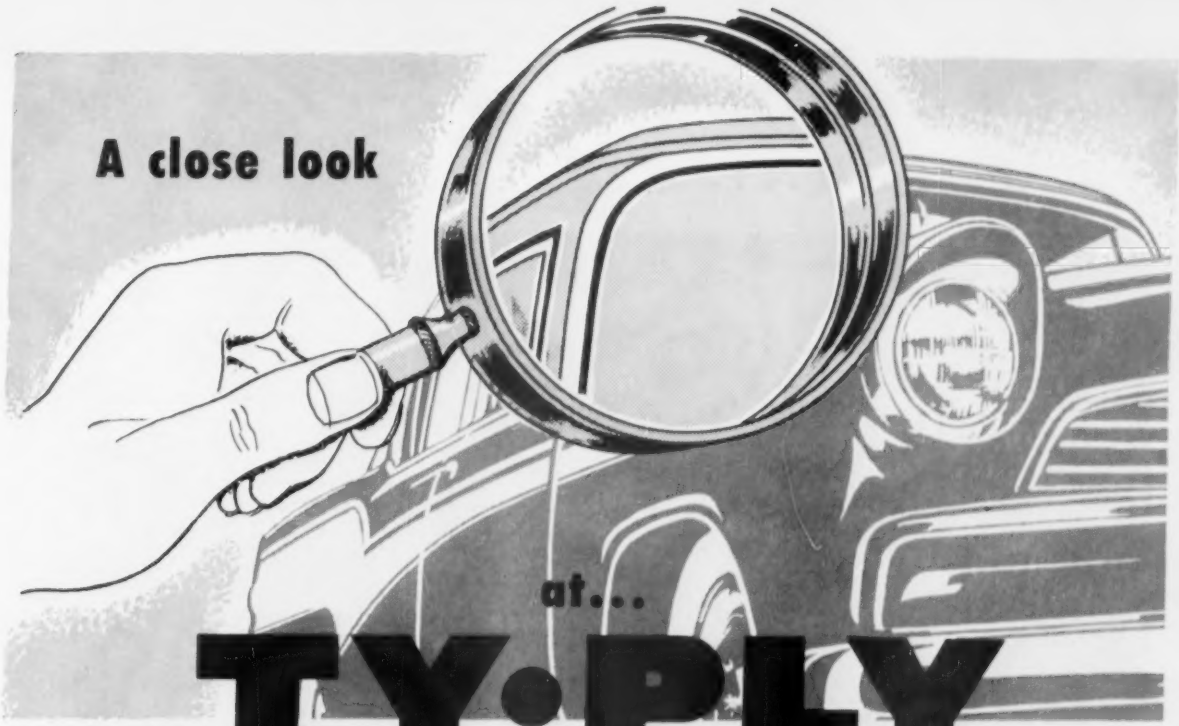

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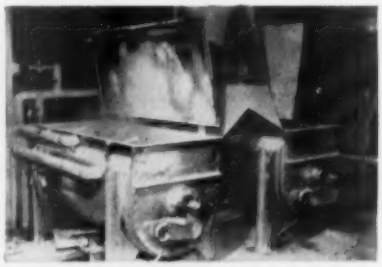

Photo shows two of many Day Blenders being used at the Goodyear Tire & Rubber Co. for mixing a variety of compounds.

Day Blenders are available in capacities from one cubic foot to 2300 cubic feet. Plain, galvanized or stainless steel tanks. Jacketing is optional. Write for Bulletin 800.

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Letters to the editor

Rubber Division Membership

Dear Sir:

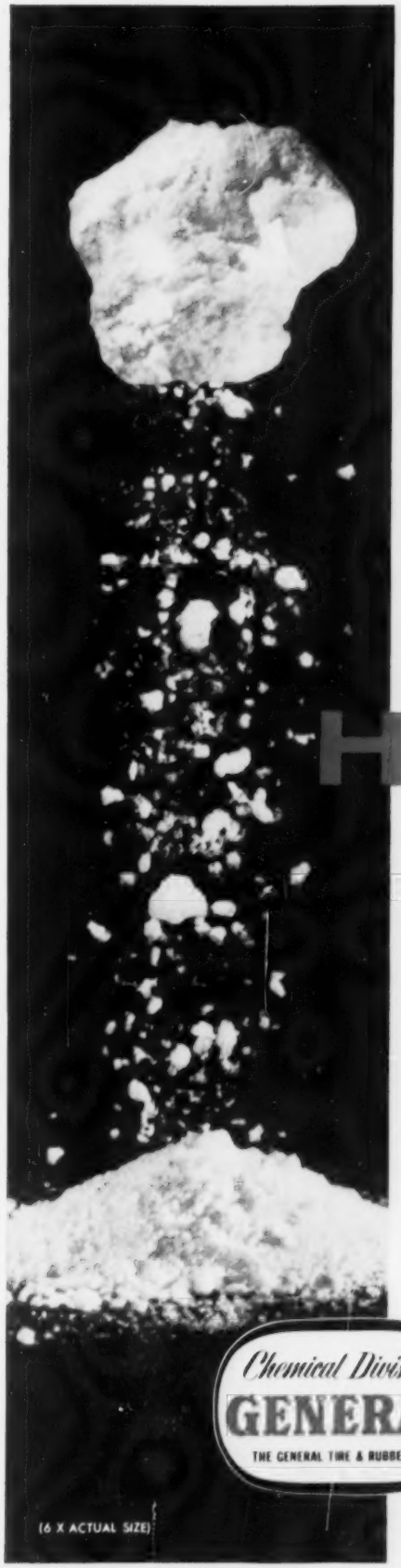
Some time ago I became interested in the make-up of the members of the Division of Rubber Chemistry of the American Chemical Society by their company affiliation. The method by which this was done was the April, 1954, Rubber Division Directory. Approximately 2600 members were listed. These were divided among 710 different companies in the United States, with some 300 members from outside of the United States. It was interesting to note that of the 710 different companies, 478 had one member, 119 had two members, 37 had three members, and so on. There were, however, 11 companies that had more than 20 members. These different companies with their membership are listed in the accompanying table.

DISTRIBUTION BY COMPANIES OF MEMBERS OF RUBBER DIVISION

Companies	1948 Number of Members	1948 % Total Members	1954 Number of Members	1954 % Total Members	1956 Number of Members	1956 % Total
United States Rubber	212	10.82	247	9.80	238	8.27
Goodyear	124	6.32	125	4.95	136	4.72
Goodrich	122	6.22	123	4.88	149	5.17
Firestone	81	4.13	123	4.88	124	4.31
DuPont	57	2.81	100	3.95	122	4.24
Phillips Petroleum	20	—	43	—	43	—
Vanderbilt	25	—	32	—	32	—
Minnesota Mining	17	—	29	—	29	—
Monsanto	17	—	28	—	28	—
General Tire & Rubber	15	—	24	—	22	—
Standard Oil Dev. (Esso)	35	—	—	—	—	—
Number All Members	1960	—	2520	—	2880	—
Total % First Five	—	30.30	—	28.46	—	26.71

Since then, we have had a 1956 Directory, and this was analyzed in a somewhat similar manner, and the companies that had over 20 members in 1954 were counted for the 1956 Directory and added to the table. The 1948 Directory was analyzed in the same way to complete the picture.

It may be of interest to note that the additive percent of the first five largest companies has decreased from a figure of



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30.3 in 1948 to a figure of 26.7 in 1956. This may mean the addition of many more members from smaller companies which is indeed an excellent thing for the industry.

J. McGAVACK

Plantation Division
U. S. Rubber Company
New York, N. Y.

Literature Note

Dear Sir:

Earlier this year we sent you our Information Bureau Circular No. 430, setting out the Systematic Classification of Scientific, Technological and Commercial Information on Rubber in full, together with an abridged version for smaller users.

This abridged version has been well-received and it has been suggested that an even more drastic cutting-down might be acceptable to some users, interested in the classification of books and small collections of abstracts.

Such a skeleton version has now been prepared and a copy will be furnished to all interested parties.

T. H. MESSENGER

The Research Association of
British Rubber Manufacturers,
Shawbury, England

The skeleton version referred to by Mr. Messenger is one of the several steps in the right direction which have been taken by the RABRM in recent years. A description of the latest version appears in the news columns of this issue and we urge our readers to secure, study and adopt the proposed classification.—ED.

Continued Association

Dear Sir:

Thought you might be interested in learning that we have purchased all the capital stock of T. A. Desmond & Co., Inc. The name of Desmond in the rubber business goes back to the past 50 years.

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New York, N. Y.

Memo from the Editor

The "Letters to the Editor" columns were recently inaugurated. They are open to all of our readers and we invite you to send along your comments for publication. These comments may be specifically applied to published articles and news items or may reflect your own views on any facet of the rubber industry. We reserve the right to edit all material. Address: Editor, RUBBER AGE, 101 West 31st St., New York 1, N. Y.

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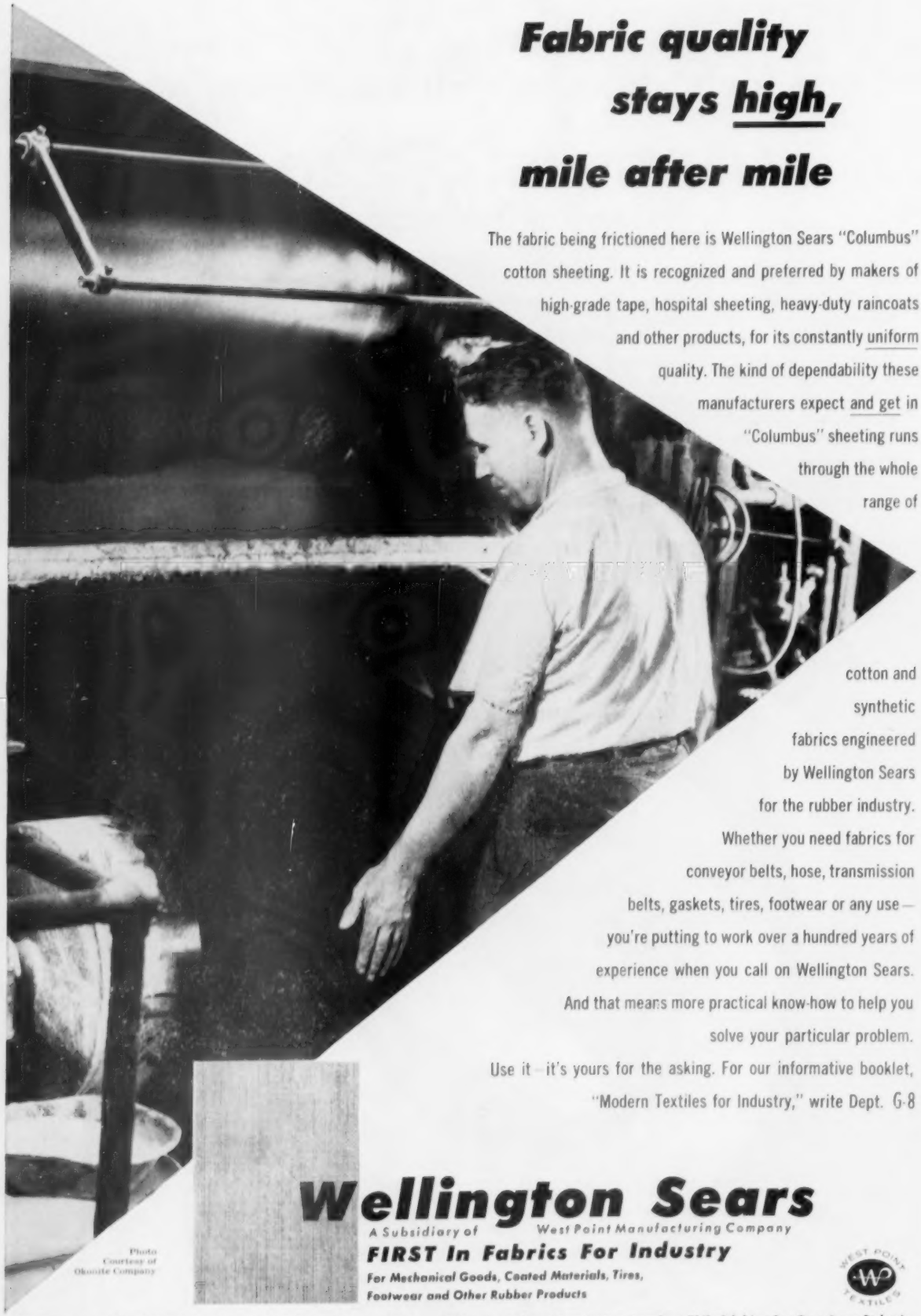

Photo Courtesy of Okonite Company

Fabric quality stays high, mile after mile

The fabric being frictioned here is Wellington Sears "Columbus" cotton sheeting. It is recognized and preferred by makers of high-grade tape, hospital sheeting, heavy-duty raincoats and other products, for its constantly uniform quality. The kind of dependability these manufacturers expect and get in "Columbus" sheeting runs through the whole range of cotton and synthetic fabrics engineered by Wellington Sears for the rubber industry.

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FIRST In Fabrics For Industry

For Mechanical Goods, Coated Materials, Tires, Footwear and Other Rubber Products

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hi-sil®
calcene®
silene®

COLUMBIA-SOUTHERN PIGMENTS

impart desired properties to rubber stocks

Columbia-Southern's family of white reinforcing pigments—Hi-Sil, Calcene, Silene—are of outstanding value in natural rubber, GR:S, butyl and other synthetic stocks.

One of these pigments usually will give you the physical property you are seeking, but in some cases, a combination of the pigments is required. In any event, if you have a rubber reinforcing problem, it will pay you to investigate Hi-Sil, Calcene and Silene now.

Here's how Hi-Sil, Calcene, Silene can help you

- Make white or light colored rubber goods possible while providing excellent vulcanizate reinforcement.
- Increase tensile strength, elongation or tear.
- Improve abrasion resistance.
- Dry sticky or gummy reclaim stocks to a workable consistency.

Columbia-Southern pigments are solving rubber compounding problems every day . . . making rubber products perform better and look better, frequently at no added cost.

For property tables, experimental working samples, or recommendations, contact Pigments Department today at our Pittsburgh address.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY

ONE GATEWAY CENTER · PITTSBURGH 22 · PENNSYLVANIA

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its Commercial Chemicals Division

Lipstick and candy and rubber sole shoes

(From the song hit of the same name)*

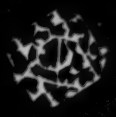
Rubber sole shoes popular in song today—are popular everywhere with adults and youngsters alike . . . because they're comfortable and wear so well.

To insure that rubber soles stay flat, retain their dimensional stability, many manufacturers use Solka-Floc—a finely divided, highly purified cellulose. Used in other products such as floor tile, for example, Solka-Floc reduces blistering and nerve, improves dispersion, controls shrinkage, permits sharper designs and harder, smoother surfaces . . . with notable economy.

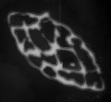
If you have a problem in the processing of your products—perhaps Solka-Floc can help you too. Write Dept. GF-8, Brown Company, 150 Causeway Street, Boston 14, Mass.

*By Bob Haymes as recorded by Julius LaRosa for Victor. Copyright Jimskip Music, Inc., 1956.

SOLKA-FLOC®



FINEST QUALITY



UNITED BLACKS

United Blacks . . . they are the quality blacks

so dependable and so helpful in today's rubbers. UNITED BLACKS are used everywhere, for every rubber need.

KOSMOS 70 ISAF — Ideal for toughest treads, maximum mileage tires, for gruelling high speed highway operations, and for high electrical conductivity.

KOSMOS 60 HAF — Recommended for good processing, highest reinforcement, extra mileage tires, tread rubber (camelback), and outstanding resistance to cuts and cracks.

KOSMOS 50 FEF — Superior as processing aid; for imparting good, smooth, fast extrusions; for maintaining dimensional stability; for dissipating heat.

KOSMOS 40 HMF — Recommended for good processing, substantial reinforcement, ready dispersion, high rebound, low heat build-up, high resistance to flex.

KOSMOS 35 GPF — For tire body stocks and general purpose applications where high resiliency, low heat build-up, high strength at elevated temperature and good flex resistance are essential.

KOSMOS 20 SRF — Excellent for highly loaded rubber goods; easy and cool mixing; semi-reinforcing; low in heat generation; high in resilience.

KOSMOBILE 77 EPC — Recommended for good processing, for high level of reinforcement, high tensile strength, good resistance to abrasion.

KOSMOBILE S-66 MPC — For rubber goods requiring high reinforcement, high tensile strength, highest resistance to tear and good resistance to abrasion.

KOSMOS BB (Voltex) CC — Ideal in polyethylene for resistance to ultraviolet radiation; for coloring of plastics and for high electrical conductivity.

Keep in step with the times . . .

Standardize on UNITED BLACKS

UNITED CARBON COMPANY, INC.

A subsidiary of United Carbon Company

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FIRESTONE EXPANDS ALL ITS RUBBER PRODUCING FACILITIES TO SERVE YOU BETTER...

Native tapping rubber tree on Firestone's Liberian Plantations . . . over 10,500,000 trees under cultivation.

Production at Firestone Synthetic Rubber Plants was increased 50% in the first year of Firestone operation.

Look to the World's Largest Rubber Producer for All Your Requirements

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Over 30 Years Plantation Experience

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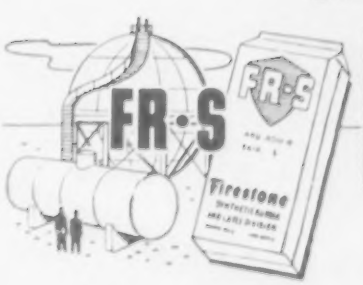
A Producer Since Before Pearl Harbor
Now Delivering FR-S...The New High Standard of Synthetic Rubber



Firestone

BEST IN RUBBER

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TITANOX®

You'll never get a wrong number when you use TITANOX—that is, in your line of plastic products.

As whitening, brightening and opacifying agents, nothing can surpass TITANOX titanium pigments for adding eye-appeal to plastics. Titanium Pigment Corporation (subsidiary of National Lead Company), 111 Broadway, New York 6, N. Y.; Atlanta 5; Boston 6; Chicago 3; Cleveland 15; Houston 2; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 14, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

New life for tired tires!

OSBORN brushing methods simplify and improve the preparation of worn, heavy-duty tire casings for retread.

As the casing revolves on its holder, a special 12″ Osborn wire brush chews away all old, worn rubber . . . leaves the evenly roughened, uniform surface essential to a good recapping.

An **O**sborn **B**rushing **A**nalysis, made right in your plant, will show how power brushing can improve and speed up many cleaning and finishing operations. Write *The Osborn Manufacturing Company, Dept. J-6, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Osborn Brushes

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BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES
BRUSHING MACHINES • FOUNDRY MOLDING MACHINES

SILASTIC GUMS help your research men turn the wheels of progress

Here's the first silicone rubber tire ever produced. Built in cooperation with Dow Corning by a group of rubber research and development engineers, this tire was designed to explore another area of potential usefulness for Silastic.* Such studies become more urgent as design engineers find an increasing need for rubbery materials that retain good physical and dielectric properties in service at temperatures above 200 F. Looking toward future developments in tires, mechanical rubber parts or electrical insulating systems, you'll find that Dow Corning is your best source of silicone rubber research materials and technical assistance. We offer your research men sample quantities of the most complete line of silicone gums available — sulfur vulcanizing, peroxide vulcanizing and fluid types.

These Silastic PROPERTIES mean better products . . . *Low compression set without toxic additives. Serviceability at temperatures ranging from —100 F to 500 F. Maximum resistance to weathering, ozone, corona. Ideal dielectric properties. High tensile strength with silica fillers.*

Easier PROCESSING means lower products costs . . . *Easy-to-compound Silastic Gums or master-batches reduce processing time, assure more efficient use of your mills, save capital investment in extra equipment. Dow Corning's 10 years of experience in compounding silicone rubber is available to you either in the field or at Midland, Michigan.*

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MIX YOUR SHIPMENTS . . . Choose your own combination of grades . . . or let your Cabot representative help you to select the grades best suited to your own requirements. Only Cabot offers a complete range of channel, furnace and thermal blacks . . . mixed shipment savings from a single manufacturer.

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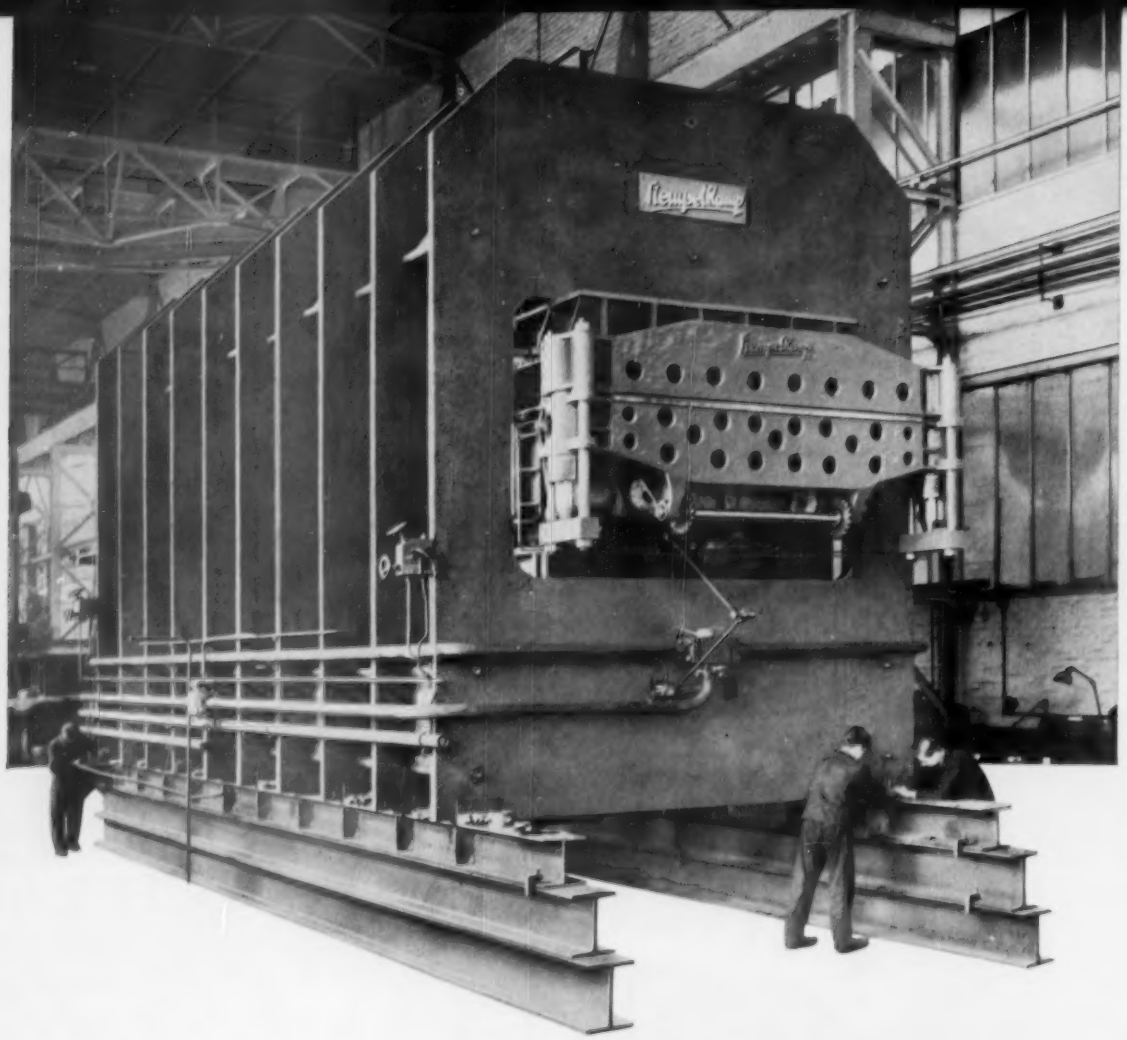

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Hydraulic Rubber Belt Presses

Dimensions up to 600 ins. by 128 ins.
The leading rubber works in Europe are working with Siempelkamp Belt Presses
The largest specialised plant for Hot Plate Presses

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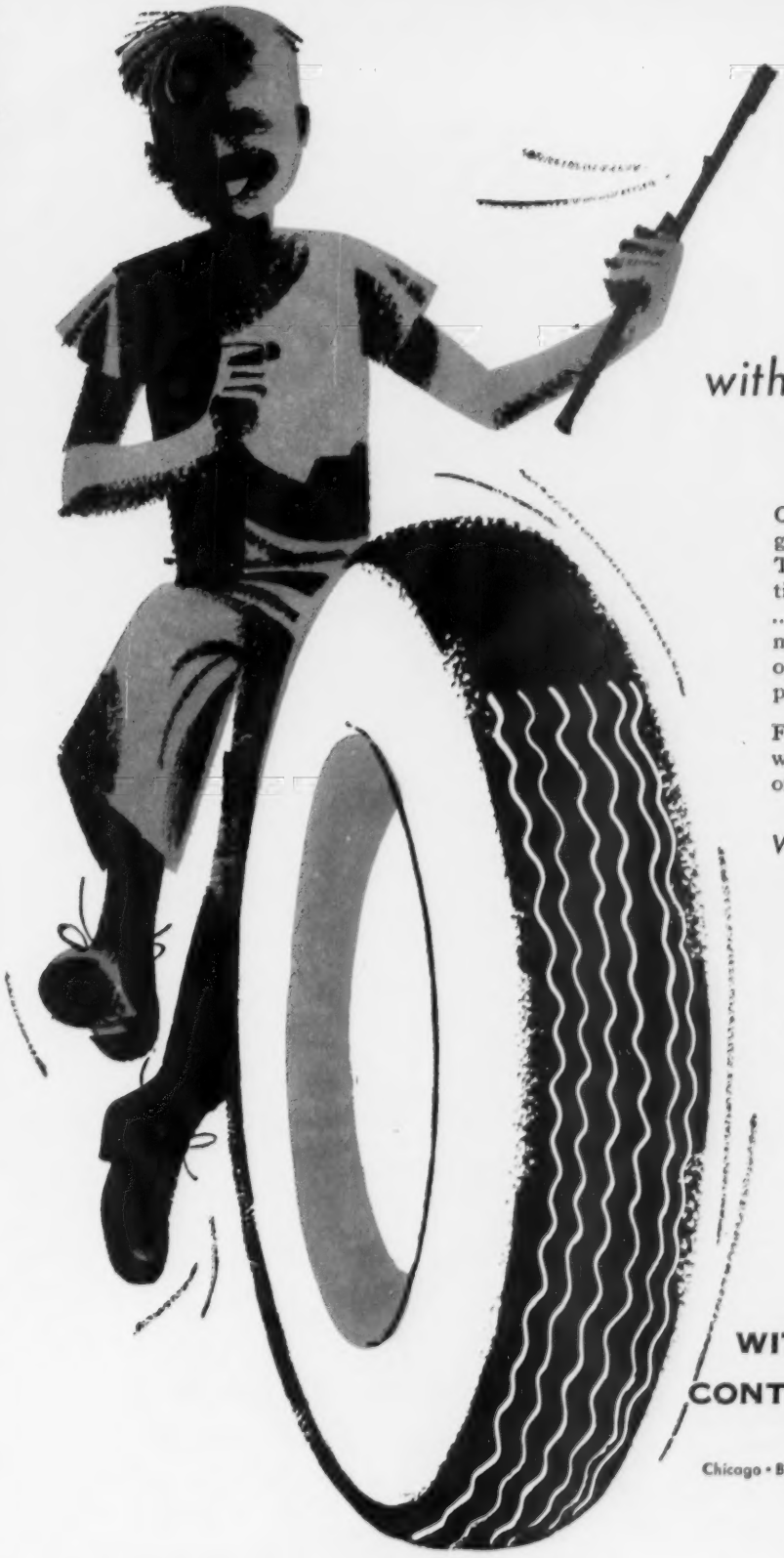

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with the rubber industry

Over the years, Witco-Continental has grown steadily with the rubber industry. This planned expansion of our plant facilities...research and technical laboratories ...places us in an excellent position to meet every rubber black need and to assist our customers with their carbon black problems.

For prompt, integrated service, phone or write your nearest Witco-Continental office.

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Continex® SRF—Semi-Reinforcing
Continex SRF-NS—Non-Staining
Continex HMF—High Modulus
Continex HAF—High Abrasion
Continex FEF—Fast Extruding
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CHANNEL BLACKS

Continental® AA—(EPC)—Witco No. 12
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WHATEVER YOU VULCANIZE YOU'LL VULCANIZE BETTER

with the new Taylor

FLEX-O-TIMER*

timed program controller

ALREADY accepted as the ideal "Robot Brain" for tire vulcanizing, this new Taylor Timed Program Controller gives greater precision than ever to the timing and coordination of automatic presses used for any mechanical goods.

Settings can be quickly changed to accommodate different types of goods or for variations in compounding. It will actuate switches, turn valves and perform many other operations involving temperature, pressure, mechanical motion, electrical energy or any combinations of these . . . and perform each function in exactly the same way time after time. It will handle automatically from one to eight electric or pneumatic operations.

Set-up speed is increased because direct time settings are possible, giving greater accuracy, speed and convenience. Program trip pins are manually positioned to the exact time at which a function is to be operated. These settings are duplicated in the step mechanism, so no operator computations are necessary; precision of settings is assured.

Duration of an operation may be timed to a minimum of 1½ seconds; time cycle from 3 minutes to 4 hours is available; time dial automatically resets to zero in maximum of 13 seconds on completion of cycle; minimum time between program trip pins—7½ seconds on 30 minute cycle dial.

Your Taylor Field Engineer can give you detailed information about this new instrument, or write for **Catalog 98350.** Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

*Reg. U.S. Pat. Off.

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

to help you select

SHELL DUTREX

PLASTICIZERS and EXTENDERS

For GR-S and Natural Rubber

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Dutrex 20
Dutrex 15E
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Dutrex 39
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For Butyl Rubber

Dutrex 31
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Dutrex 25

For Neoprene W types

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SHELL OIL COMPANY

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SHELL

CONGRATULATIONS on Your 15th Anniversary

May 1st marked the Fifteenth Anniversary of the introduction of the Series E Savings Bonds. In a deeper sense it was *your* anniversary, because you, in 1941, helped to initiate and build a thrift movement new to America—The Payroll Savings Plan for the purchase of Series E Bonds.

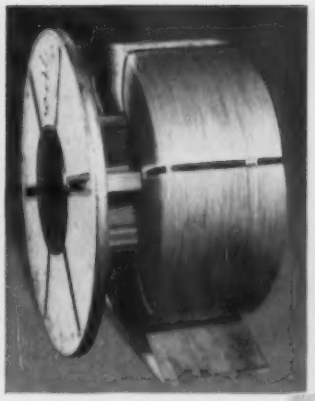
In the intervening years millions of men and women have invested billions of dollars in Series E Bonds through the Payroll Savings Plan.

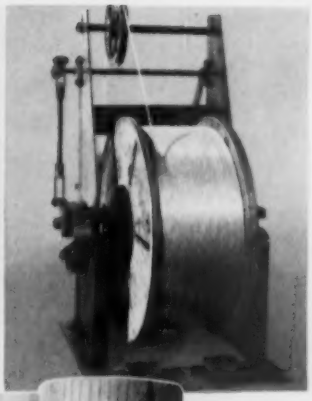
Today, forty million Americans hold Series E and Series H Bonds (the H Bond was introduced in 1952) with a cash value of more than $40 billion—a reservoir of future purchasing power. In addition, Savings Bonds have paid for college educations, new homes, retirements and other family needs.

To the executives of more than 40,000 companies that have the Payroll Savings Plan . . . the 8,000,000 employed men and women who invest $160 million per month in Series E Bonds . . . the publishers of 500 business papers . . . the managements of all other media who give freely of their time and space . . . the Advertising Council . . . the advertising agencies who contribute their skills . . . to *all* of you who have had a part in the success of the Payroll Savings Plan, the United States Treasury offers its heartfelt thanks.

Secretary of the Treasury

RUBBER AGE





Top Left—*Pneumatic coil lifter* positioning reelless coil over saddle block prior to removal of paper wrap and assembly of let-off reel.*

Center—*Partly assembled pneumatic let-off reel.* Note provision for removal of steel strapping and easy assembly of reel to coil on saddle block.*

Top Right—*Completely assembled reel with bead wire coil mounted on conventional let-off stand.*

*Patents Pending

ESTIMATE YOUR SAVINGS

...with National-Standard reelless bead wire methods!

THIS development combines the completely reelless shipment, storage and handling of bead wire with a new type of wire let-off reel for tire production. Here are some of the direct advantages:

- Shipping tare cut to a fraction . . . and *no reels to return.*
- Completely wrapped coils for better and prolonged wire protection.
- Less than half the time and effort formerly required for unloading and in-and-out-of-storage handling.
- Storage capacity multiplied by easy, safe stacking of palletized coils.
- Palletized storage with complete accessibility permits ideal inventory rotation.
- Improved production. Pneumatic let-off reels (easily, quickly applied to coils at point of use) assure uniform flange pressure throughout pay-off, eliminating tangling, breaking and down-time.

These are a few high points of this new development. Look into it. We'll gladly give you complete details. Just let us know.

NS NATIONAL-STANDARD Company NILES, MICHIGAN

NATIONAL-STANDARD COMPANY • NILES, MICHIGAN
Tire Wire, Stainless, Fabricated Braids and Tape

ATHENIA STEEL DIVISION • CLIFTON, N. J.
Flat, High Carbon, Cold Rolled Spring Steel

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Industrial Wire Cloth

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Special Machinery for Metal Decorating

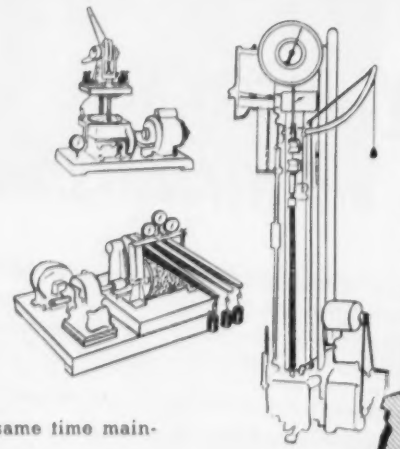
WORCESTER WIRE WORKS DIVISION • WORCESTER, MASS.
Round and Shaped Steel Wire, Small Sizes

What Makes This Reclaim *Special?*

To the naked eye, one piece of Reclaimed rubber looks the same as another. Even measurable physical and chemical properties may be sufficiently close to indicate similarity.

However, day by day trouble-free processing, and uniformity of your finished product depends on your selection of the producer of the Reclaim.

PEQUANOC Reclaim is *Special* because its quality is uniform and is backed by 55 years of experience and "know-how." Quality control of all raw materials and manufacturing processes guarantee an end-product of uniform composition with high performance characteristics.



If you are interested in reducing costs and at the same time maintaining quality, investigate **PEQUANOC** Reclaims.

Call or write us today. Our Technical Service Department will be glad to make recommendations.

Pequanoc Rubber Co.

MANUFACTURERS OF RECLAIMED RUBBER
MAIN SALES OFFICE and FACTORY: BUTLER, N. J.

CRYSTEX DOESN'T MIGRATE

Do you need a sulfur that won't "bloom" on white or pastel rubber? Stauffer's Crystex® is what you need . . . indeed, it's what you *must* have when you need an almost completely insoluble sulfur. Crystex is exclusive with Stauffer. Crystex fineness and other characteristics are unmatched . . . unduplicated . . . unapproached . . . unique. Crystex is a product of Stauffer Research, developed to meet special needs of the rubber industry. Available for immediate shipment in carloads, truckloads or smaller quantities.

Stauffer

Stauffer CHEMICALS SINCE 1885

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STAUFFER CHEMICAL COMPANY

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"Tumbling with Pureco liquid CO_2 eliminated die-trimming on several product lines...

and saves 3-4 hours in deflashing time", says P. W. Floeckher, Canfield Rubber Co., Bridgeport, Conn.

"Previously we would first die trim rubber parts and then finish tumble them in a barrel with Pureco "DRY-ICE". Results were good, but required time to complete. Recently we experimented with Pureco liquid CO_2. The results far surpassed our expectations. Parts which used to be die trimmed in 3 to 4 hours can now be fully trimmed in minutes.

"Quite naturally we cannot trim all our items in this manner. Nevertheless, we have found several where die trimming can be eliminated entirely."

Your Pureco man can help you discover how a "frozen" rubber tumbling technique can give you better results with savings in time, material and manpower. He can arrange for an actual demonstration in your plant. Or, he can take some of your "problem" parts to experts at the Pureco laboratories. You'll receive a confidential report on the tumbling technique that will do the best job for you.

Either way, there's no cost or obligation. Call in your Pureco man as soon as possible!

PURECO CO_2

Pure Carbonic Company

NATIONWIDE "DRY-ICE" SERVICE-DISTRIBUTING STATIONS IN PRINCIPAL CITIES

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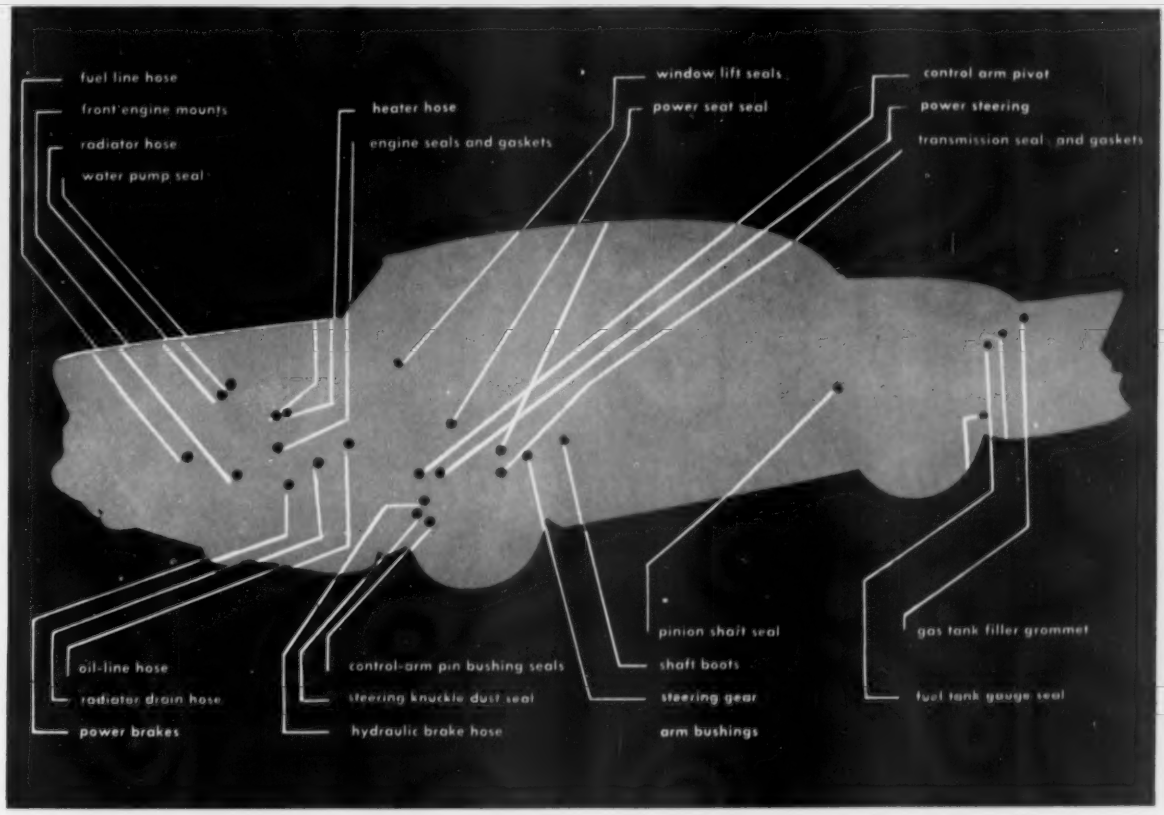
PURE CARBONIC COMPANY is a division of **AIR REDUCTION COMPANY, INCORPORATED** • Principal products of other divisions include: **AIRCO** — industrial gases, welding and cutting equipment and acetylenic chemicals • **OHIO** — medical gases and hospital equipment • **NATIONAL CARBIDE** — pipeline acetylene and calcium carbide • **COLTON** — polyvinyl acetates, alcohols and other synthetic resins.

Naugatuck Paracril



Paracril...the oil-resistant, nitrile rubber suited to many automotive applications!

Spelled-out above are just a few applications for Paracril, Naugatuck's butadiene-acrylonitrile copolymer. Unequalled in resistance to oils, fuels and organic esters, aromatic hydrocarbons, chlorinated organic liquids and most hydraulic fluids, the Paracrils provide greater tensile strength with increased dimensional stability, high abrasive resistance, unusual low-temperature flexibility, and excellent resistance to oxidation.

Paracril® stocks are fully compatible with most other rubbers and plastic resins... can be calendered, extruded, or molded by standard rubber forming methods... are easily dissolved in solvents to make low-viscosity solutions for cement applications.

Why not write to us on your company letterhead for application and test data today?

Naugatuck Chemical

Division of United States Rubber Company
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MR. CLIMCO SAYS...

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Permit Horizontal Storage of Stock

Horizontal storage is usually easier and more efficient — vertical storage has a tendency to curl the edges of the stock and liner, causing stock losses. When your liners are Climco Processed, you can confidently store them horizontally because the pressure of the roll will not cause sticking.

Climco Processed Liners will help you — whatever your method of storage.

They speed work by stopping stock adhesions and insuring easy separation. The life of your liner is increased, tackiness of the stock is preserved and loss of stock reduced. In addition to these production benefits, Climco Processed Liners protect the stock itself in many important ways.

Since 1922 Climco Processed Liners have proved their worth to the rubber industry. Give them a trial in your plant.

ILLUSTRATED LINER BOOKLET

Tells all about Climco Liners and Linerette and how to get better service from liners. Write for your copy now.

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LINERETTE INTERLEAVING PAPER
Treatment Contains NO OIL OR WAX
Samples on Request

CLIMCO PROCESSED LINERS

Serving the Industry Since 1921

SHARPLES

ETHYLAC®

for Improved Mold Flow and Fewer "Seconds"

The delayed action of Sharples ETHYLAC cures assures better mold flow, with complete and accurate molding. This results in a sharp decrease in "seconds".

When ETHYLAC is used in fast-curing molded goods, fewer rejects are encountered and quality of the finished product is materially improved.

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Technical information and samples are available on request.

SHARPLES CHEMICALS Division

PENNSYLVANIA SALT MANUFACTURING COMPANY

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SYNTHETIC RUBBER

is a product of the West, too!

Yes, even rubber "grows" in the West now . . . at Shell Chemical's rubber "plantation" in Torrance, California. This modern plant, one of the best equipped in the nation, produces a full line of butadiene-styrene type synthetic rubber to fill the needs of large and small Western manufacturers.

No matter what your end product, you'll find that Shell synthetic rubber, available in a variety of solid types and liquid latices, can do a better job for you.

Convenient location and diversity of product make Torrance your logical source for synthetic rubber West of the Rockies. In addition, Shell's Technical Service Laboratory is ready to help you find practical solutions for troublesome technical problems.

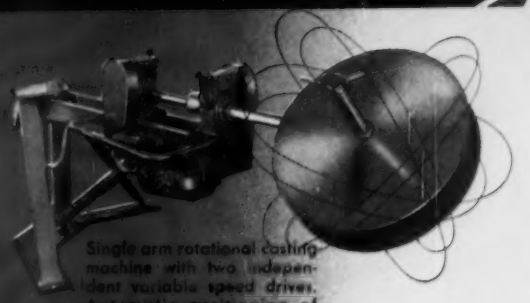
Think of Torrance, California, whenever you need synthetic rubber. Our new phone number in Los Angeles is DAvis 3-3030.

SHELL CHEMICAL CORPORATION

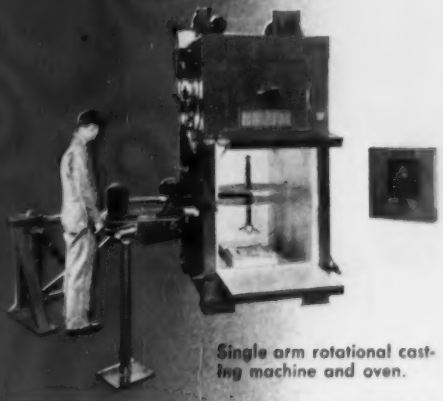
Synthetic Rubber Sales Division
P. O. Box 216, Torrance, California

SHELL

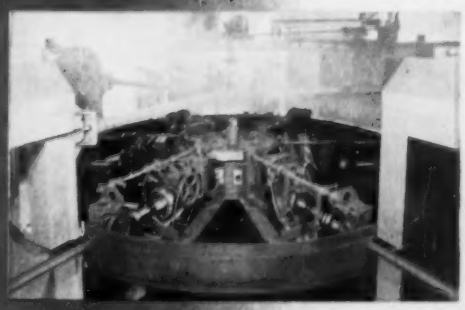
Announcing ... ROTATIONAL CASTING



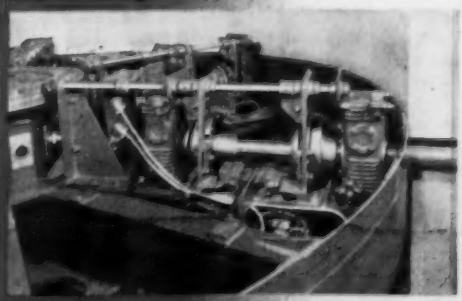
Single arm rotational casting machine with two independent variable speed drives. Automatic positioning of mold wheel for convenient mold servicing.



Single arm rotational casting machine and oven.



Multiple arm casting machine showing separate drive, clutches and brakes for mold rotation in each of the two planes. Designed for precise stopping necessary with automatic mold opening and closing.



Turntable style with six arms. An additional six arms can be added for a total of 12.

Significant Advance for Plastic Production

Machines engineered and built to your specific requirement. Following are some of the features built in our SPECIAL MACHINES.

Two groups of molds per arm, arranged for simultaneous rotation around two axes perpendicular with each other.

Two separate and variable speed drives rotate the molds around each axis. This action controls wall thickness for different product shapes.

Movement of arms is indexed for stop and go—not a continuous movement. Stopping time in oven or at the mold's service position can be varied.

Rotation of molds can be automatically stopped or started at service position and oven entrance.

Molds are automatically positioned for convenient opening, stripping, filling and closing.

A 30-inch diameter mold area allows a large range of mold sizes and flexibility of arrangement.

Arms, oven units and service stations can be added to increase capacity and mold servicing.

Sales and Engineering by

HALE and KULLGREN, INC.

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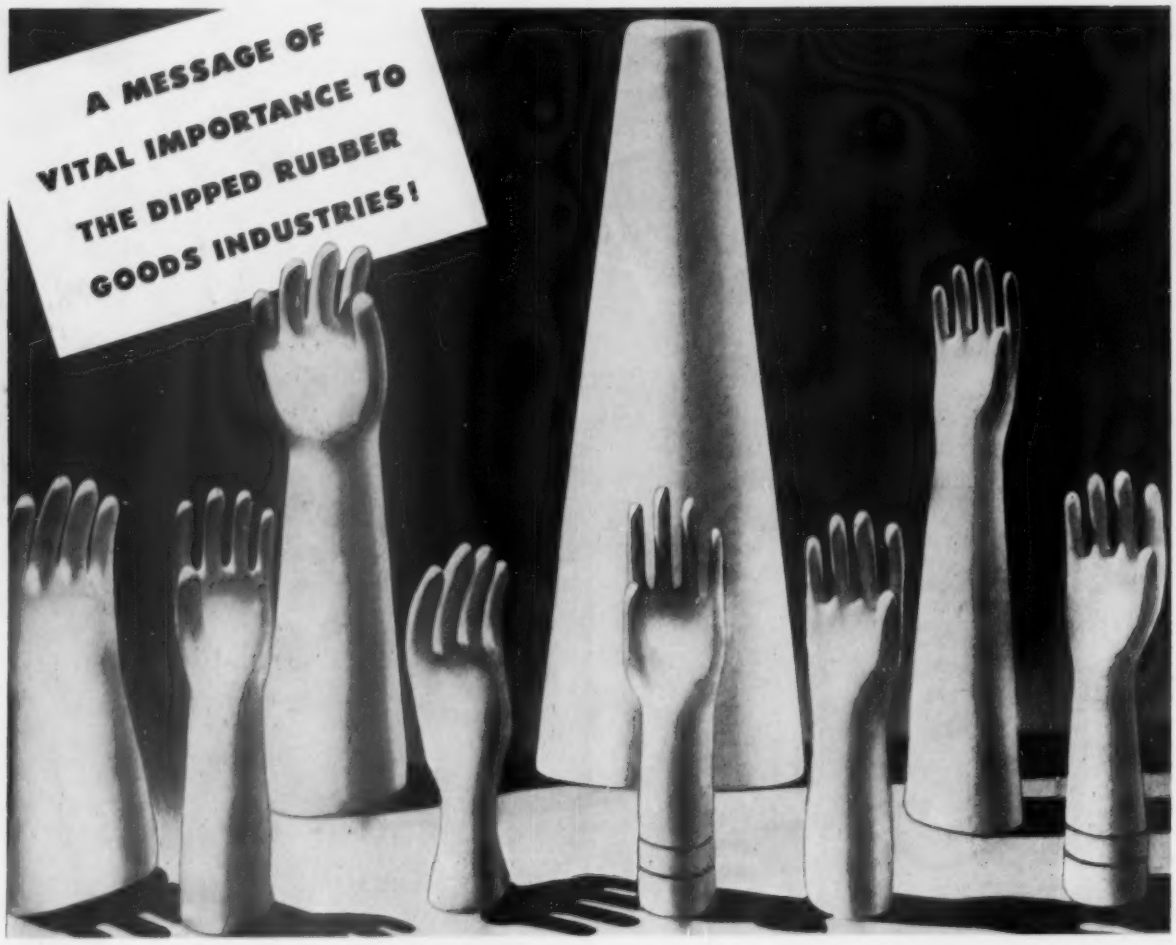

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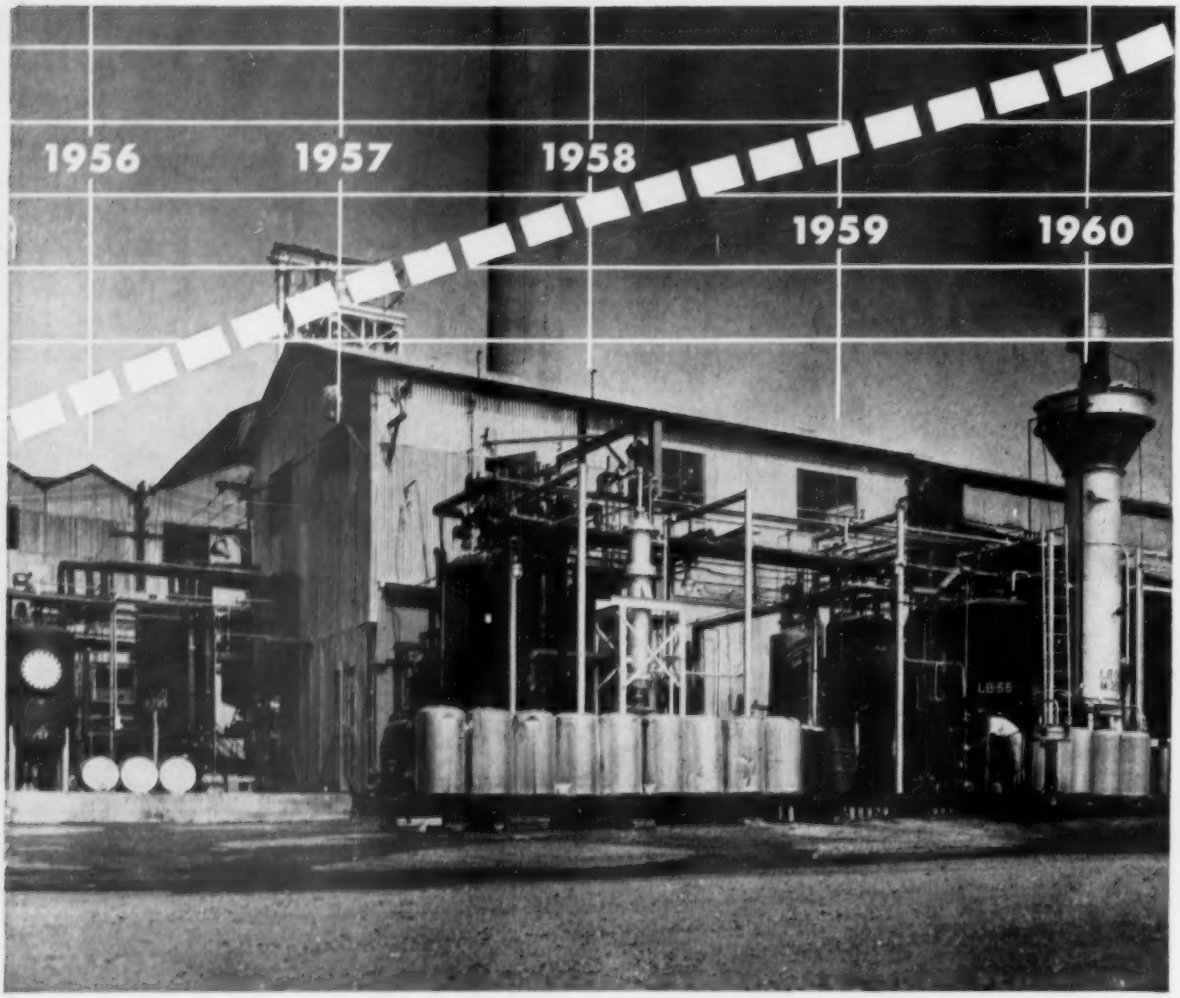

LOOKING AHEAD—This pilot plant is typical of Hercules facilities devoted to the development of new products for the rubber industry. Chart of future rubber consumption is projected on the basis of government statistics.

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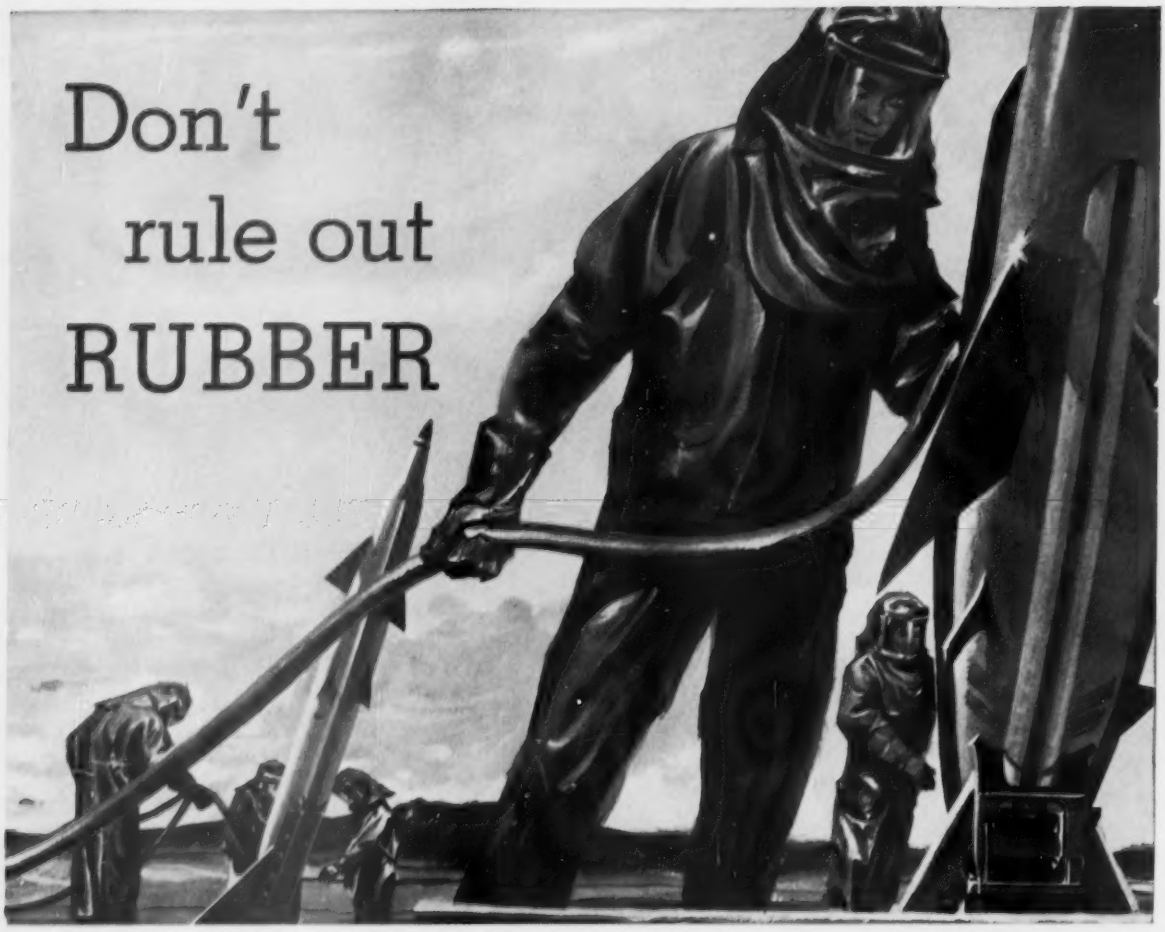

Transfer Hose of KEL-F Elastomer handles red fuming nitric acid over long periods of time without deteriorating. **Protective Clothing** of elastomer-coated fabric shields workers from corrosive materials.

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KEL-F Elastomers have convincingly demonstrated their value in a variety of industrial roles: As *sealants* for corrosive liquids, abrasion and corrosion resistant *pump impellers* . . . heat and chemical resistant *hose, tubing, diaphragms, gaskets . . . transmission, brake* and *aircraft seals* . . . corrosion and flame resistant *protective clothing* . . . electrical and shock *insulation.*

This new elastomer is a result of Kellogg's comprehensive research in fluorocarbon chemistry. Its performance characteristics are well established in the chemical, electrical and equipment fields. If your work involves rubber at any point, then KEL-F Elastomer warrants investigation.

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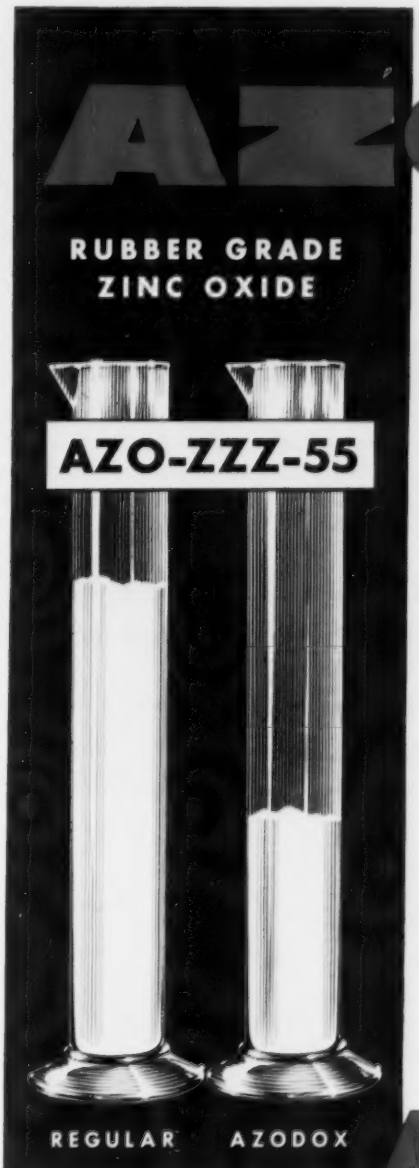

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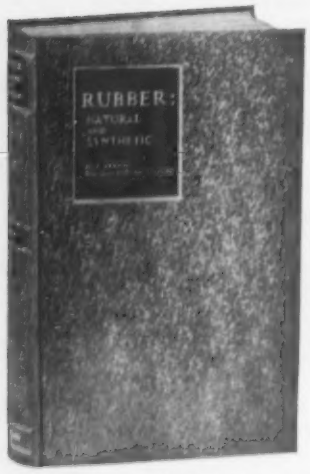

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This book fills the need for an English-language text book on all phases of rubber and rubber products manufacture. As indicated by the chapter heads, the book is of interest to rubber manufacturers, suppliers of chemicals and machinery, rubber technologists and to students of rubber who will find present-day technical procedures clearly defined.

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About the Author—

Dr. Stern has been engaged as a chemist in the rubber industry for more than 25 years and since 1935 has practiced successfully in London as a Consultant. He is the author of "Practical Latex Work" and of many publications concerned with the scientific and technological aspects of natural and synthetic rubber.

SUMMARY OF CONTENTS BY CHAPTERS

Part I

1. **Historical Introduction; Mastication; Vulcanization.**
2. **Plantation Rubber.**
3. **Natural Rubber: Composition, Reactions, Derivatives.**
4. **Properties of Vulcanized Rubber.**
5. **Compounding Ingredients.**
6. **Rubber Machinery; Solvents and Solutions; Reclaiming.**
7. **Latex.**

Part II

8. **Synthetic Rubber (History and Development).**
9. **Manufacture and Technology of Synthetic Rubbers.**
10. **Synthetic Rubber Latices.**
11. **Synthetic Resins; Plastics.**
12. **Manufacturing Processes (of various rubber products).**
13. **Testing and Analysis.**

Sources of Further Information; Metric Equivalents; Subject Index.

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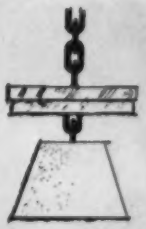

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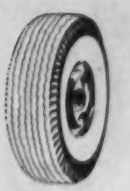

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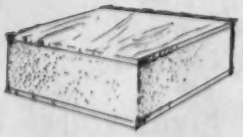

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SAME SHRINKAGE

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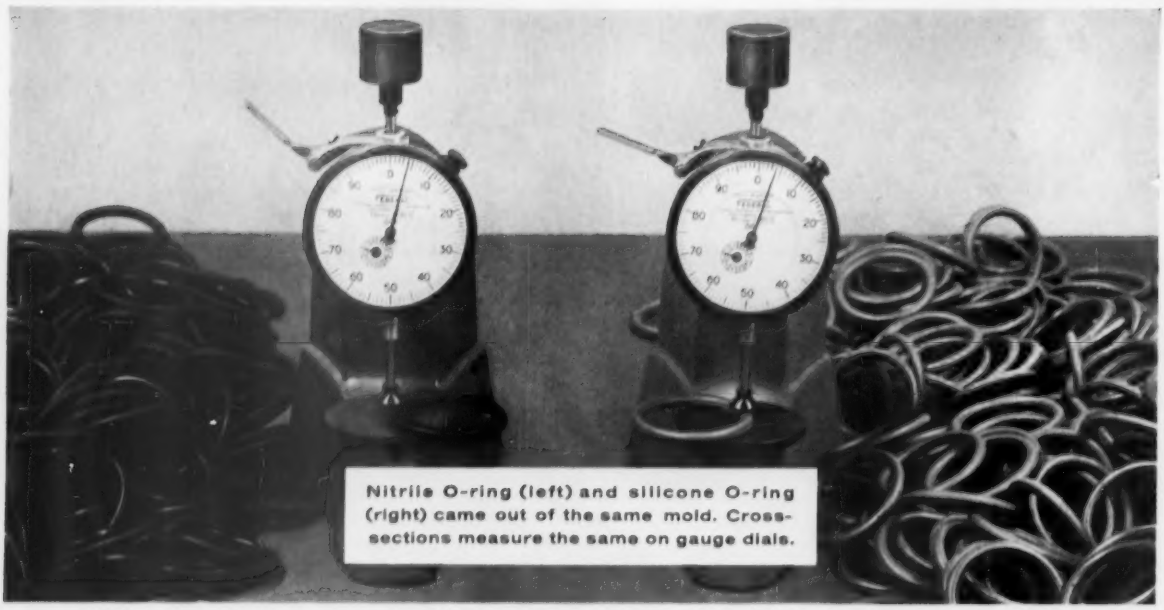

Nitrile O-ring (left) and silicone O-ring (right) came out of the same mold. Cross-sections measure the same on gauge dials.

G-E Improved Class 300 Silicone Rubber

- **Eliminates the need for special molds**
- **Maintains closer tolerances**
- **Lowers reject rate**

Now–for the first time–silicone rubber is available with the *same shrinkage as organic rubber!* General Electric's improved Class 300 makes it unnecessary to tool costly, special molds for silicone rubber jobs. It means closer tolerances on O-rings and other precision parts, meeting AN requirements without difficulty. And reject losses are practically nil, because more parts are held within tolerances.

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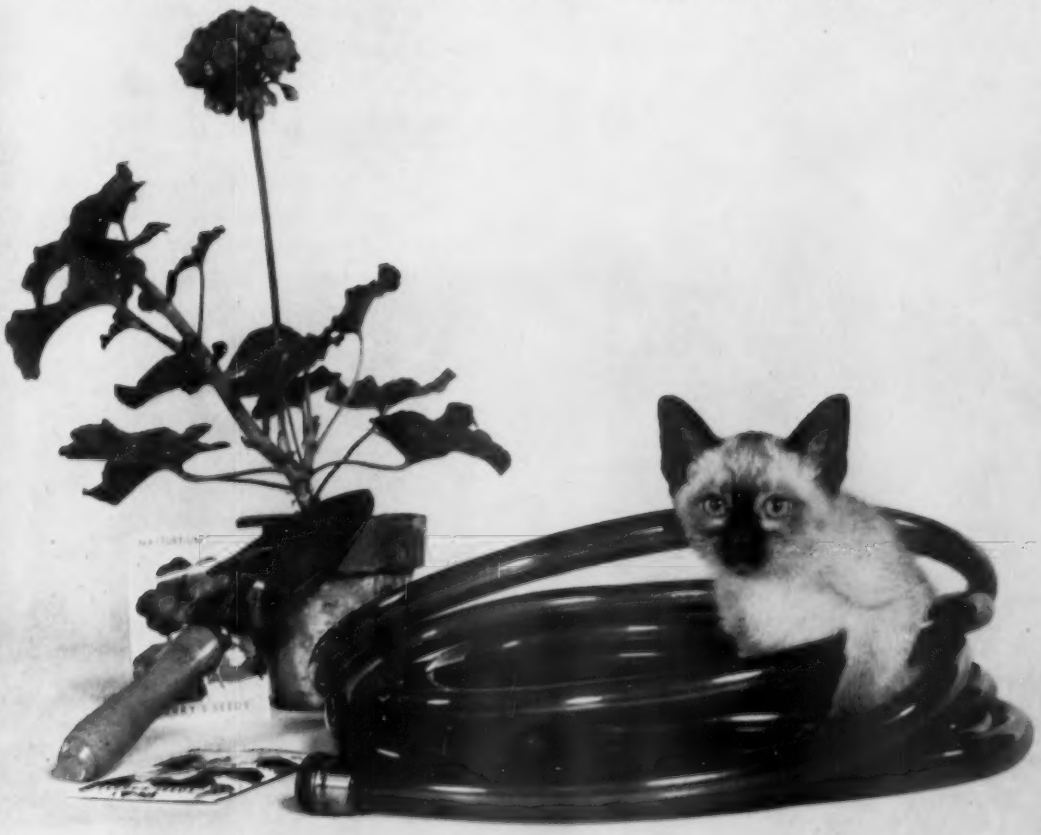

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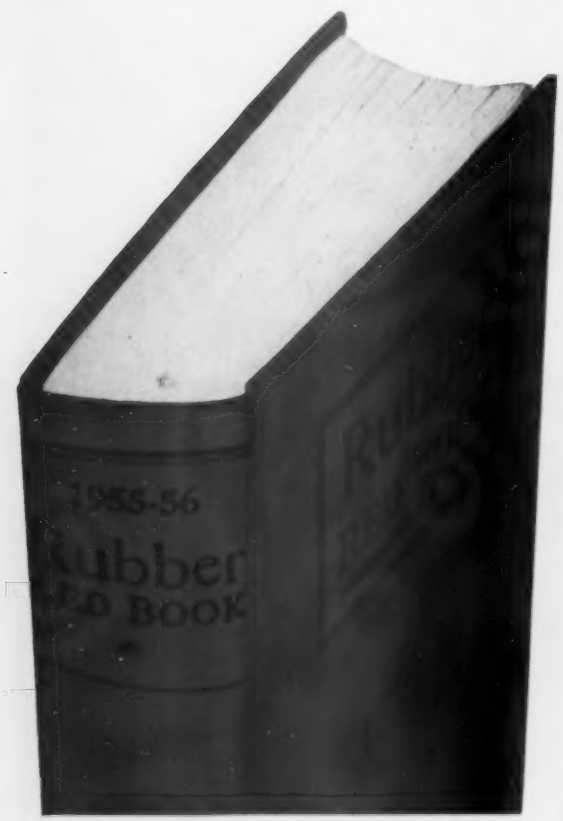

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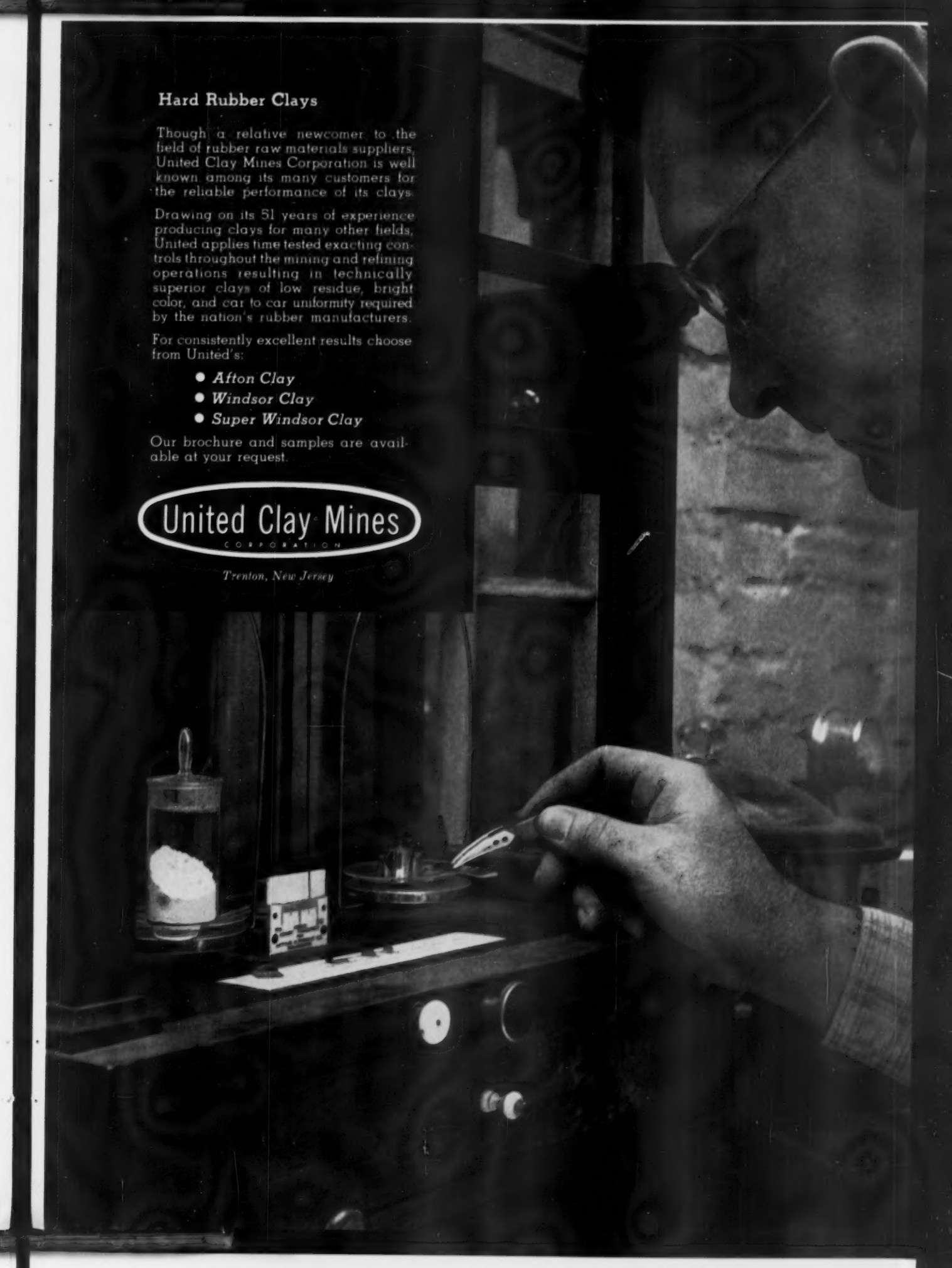

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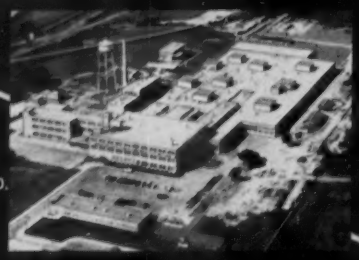

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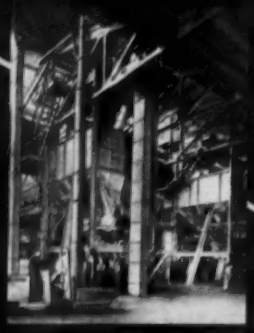

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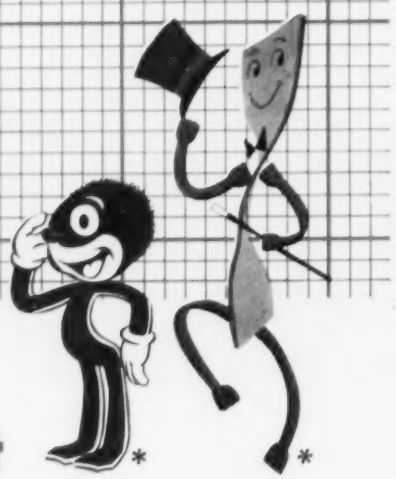

Philblack* A For Carcass Reinforcement

Present day tires are subjected to a large amount of flexing, and experience has shown that tires built with a high modulus carcass exhibit excellent performance. Philblack A imparts high modulus which results in a stronger carcass with less cord movement and low heat generation. High modulus, relatively low heat generation, good flexing properties and high tensile strength at elevated temperatures make Philblack A especially desirable for use in the carcass of the large cross-section 14-inch diameter tire.

Carcass stocks must have excellent overcure characteristics so the properties will not deteriorate in prolonged high temperature service. Excellent retention of modulus and tensile strength in the overcure range is shown in Table I for a Philblack A reinforced Philprene* rubber carcass compound (Recipe A). Table II illustrates the balance of physical properties imparted by Philblack A in a carcass compound made up of a blend of smoked sheets, reclaims and Philprene rubbers (Recipe B).

Complete Technical Service

For individual advice on processing and recipes, call your Phillips technical representative. He will give you the benefit of Phillips extensive research facilities plus years of practical experience in solving rubber problems.

SUMMARY OF PHYSICAL PROPERTIES

TABLE I

	MINUTES CURE AT 280°F					
	45	**60**	**90**	**120**	**210**	**300**
300% Modulus, psi	1090	1260	1440	1575	1530	1530
Ultimate Tensile, psi	2925	2840	2500	2550	2540	2550
Ultimate Elongation, %	650	570	460	450	445	445
Shore A Hardness	54	55	56	57	57	58

TABLE II

	MINUTES CURE AT 307°F		
	15	**25**	**40**
300% Modulus, psi	1200	1240	1240
Ultimate Tensile, psi	2310	2260	2200
Ultimate Elongation, %	500	465	460
Shore A Hardness	56	56	56
Ultimate Tensile (Aged 48 hrs./212°F), psi	1750	1740	1730
Ultimate Elongation (Aged 48 hrs./212°F), %	290	315	315
Crescent Tear Across Grain, Lbs./in. @ 80°F	222	265	283
Crescent Tear, Lbs./in. @ 212°F	158	172	179
Heat Build-up, △ T°F	—	43	47

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Zinc Oxide	5	3
Stearic Acid	2	1
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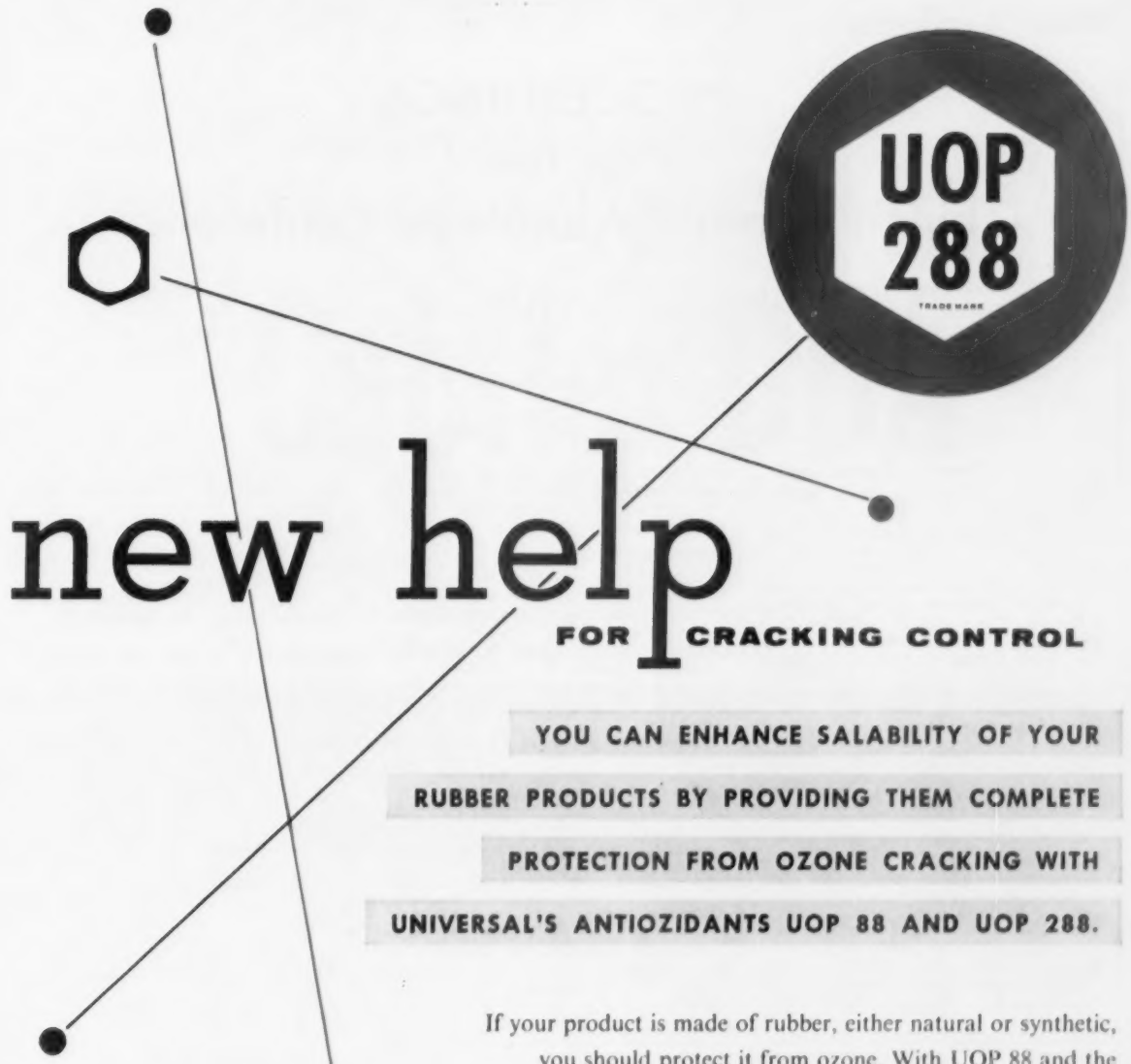

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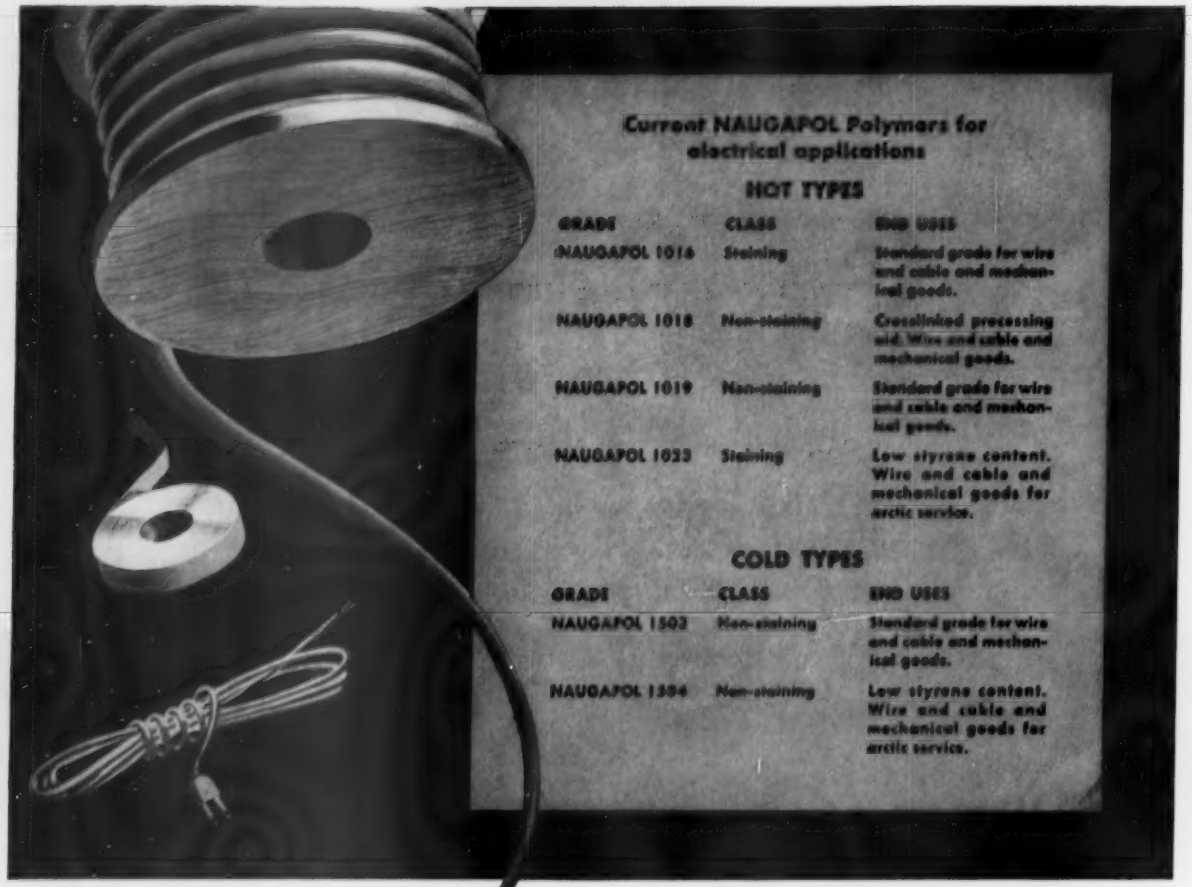

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Rubber Age

Vol. 79, No. 5 AUGUST, 1956

Exposure Cracking of Sidewall Compounds

By D. C. EDWARDS and E. B. STOREY

Research and Development Division, Polymer Corporation Limited, Sarnia, Ontario, Canada

A study of the ozone cracking behavior of Polysar S (hot GR-S) sidewall compounds is described, with particular emphasis on the combined action of an antiozidant and a protective wax. Three types of experimental procedure were evolved for this purpose, and the development and application of these techniques are described in detail.

The static exposure of spirally-deformed specimens to a controlled ozonized atmosphere showed the effects of strain on the cracking. A microscopic study of strip specimens exposed at 20% strain provided information on the induction period, the number and the growth behavior of the cracks. The exposure of specimens mounted on the sidewall of a tire proved to be a simple and economical means of testing under conditions nearly identical to those of actual service.

Both the wax and the antiozidant decrease the number of cracks at a given strain. The antiozidant also retards the growth rate of the cracks. The protective action of combinations of the wax and antiozidant is greater than would be predicted from the individual performances of the two agents, and the use of such combinations provides the best protection against cracking. Mechanical failure of the surface wax film was not observed in the sidewall test, even with a loading of as much as six parts of wax.

THE formation of many fine cracks on the surface of the sidewall portion of an automobile tire during service is a well-known phenomenon. This effect results in an undesirable appearance and may reduce the life of the tire in service. A number of investigators have shown through laboratory tests that cracks may form when a vulcanizate is placed under strain in the presence of small concentrations of ozone and it is believed that these are the two primary causes of cracking. The present study was designed to provide methods of assessing the effects of various compounding ingredients upon sidewall cracking.

Among the numerous laboratory tests devised to study ozone cracking, those published by the American Society for Testing Materials are the most widely accepted *(1, 2, 3)*. These tests are accelerated by exposing the vulcanizate at a relatively high strain, at an elevated temperature, or to somewhat high, controlled concentrations of ozone. The sidewall portion of a tire, however, is subjected to small variable strains and to the prevailing atmospheric conditions.

Under normal conditions, the concentration of ozone in the atmosphere has been estimated to vary between zero and six parts per hundred million parts of air *(4)*. An ozone concentration of 25 parts per hundred million parts of air is usually employed in laboratory tests and it is considered that this higher concentration of ozone simply accelerates the formation of cracks. The selec-

Note: This paper was presented before the Rubber Chemistry Division, Chemical Institute of Canada, Montreal, Canada, May 30, 1956.

TABLE I—GENERAL TEST RECIPE

(Press Cure: 35 Mins. @ 292°F.)

Polysar S (hot GR-S)	100.00
FEF carbon black	30.00
SRF carbon black	10.00
Circosol 2XH	10.00
Antioxidant	variable
Improved Sunproof Wax	variable
Zinc oxide	3.00
Stearic acid	2.00
Santocure	1.25
Crystex	2.00

tion of the strain under which the vulcanizate is exposed to ozone, however, may have a controlling influence upon the interpretation of the results.

Every vulcanizate exhibits a threshold strain below which no cracks are formed. At slightly higher strains, a few, very long and deep cracks are formed while at still higher strains very many shallow cracks will be produced. The sidewall of a tire is exposed to strain up to about 10% in service and the threshold strain of the vulcanizate must be above 10% if cracking is to be absent in service. Any procedure that gradually improves the resistance to cracking will cause the vulcanizate to progress from the condition of many fine cracks to deep cracking before it becomes crack-free.

A means has been developed to assess the effect of ingredients upon the induction period and growth rate of cracks and a spiral mount, by which the specimen is subjected to a graded range of strains, provides an estimate of the threshold strain. In order to correlate the laboratory procedures with service conditions, a method has been devised to attach the vulcanized specimens to the sidewall of a tire.

Experimental Procedure

Test Recipes: The tests were carried out on Polysar S (hot GR-S) compounds prepared in the recipe shown in Table I. In order to reduce the effect of compounding variables, three masterbatches of this base recipe were prepared, one containing 4 PHR of Improved Sunproof Wax, one containing 4 PHR of Santoflex AW, and the other containing no wax or antiozidant. These masterbatches were mill-blended in the proper proportions to provide compounds having from zero to two PHR of each ingredient in all combinations at one-half part intervals. An initial test showed that there was no significant effect of these ingredients on the rate of vulcanization of the base recipe nor did the state of cure have a significant effect in the region of the optimum cure. All compounds, therefore, were cured for 35 minutes at 292°F.

Additional compounds were prepared by adding various quantities of U.O.P.-88, NA-22, or PBNA to a masterbatch of the base recipe.

Microscope Study: Vulcanized sheets, 6" x 6" x 0.075", were allowed to cool to room temperature after removal from the press and the surface was coated with a 25% solution of Vinylite VYNS in acetone. Strips ⅜-inch wide were cut from the sheet, the Vinylite film removed, and bench marks were placed exactly four inches apart on the specimen. The specimen was clamped in a rack, elongated until the bench marks were exactly 4.8 inches apart, and clamped in this position.

After mounting, the surface of each specimen was cleaned in order to remove any finger marks or other contamination. The cleaning was done with pieces of soft, foam sponge. Each specimen was rubbed gently in single smooth strokes with sponges: (a) moistened with ethanol, (b) dry, (c) moistened with benzene, and (d) dry. The prepared specimens were placed in a drawer, covered with sheets of paper, and conditioned for 72 hours at room temperature.

The specimens were exposed in a modified Bush Ozonator *(5)* to an atmosphere containing 25 ± 5 parts of ozone per hundred million parts of air at an ambient temperature of 120°F. During the first 30 hours of exposure, the position of the samples in the chamber was changed every hour to take account of any variation in conditions throughout the chamber. A microscopic examination of the surface of the specimen was made at intervals of five hours during the first 30 hours, 15 hours during the next 45 hours and at 25-hour intervals thereafter. Between these intervals, the specimens were stored in an ozone-free atmosphere.

The examination was conducted with a stereoscopic microscope at magnifications of 20x, 60x and 150x. At the first appearance of cracks, an area judged to be typical of the specimen was chosen by scanning the surface at low magnification and circled with a silver pencil. The number of cracks visible in the field was counted and the area was determined by placing the edge of a 200-mesh screen in the field. So far as possible, the measurement of the maximum number of cracks was made at a time in the development of cracking when no new cracks were forming but prior to the period when cracks began to join together. For crack size and growth measurements, the largest cracks were chosen and those that were situated close to other cracks, and therefore likely to encounter interference effects, were avoided. The length of a crack was measured by placing the edge of the 200-mesh screen adjacent to the crack. The induction period was estimated by extrapolating the length versus time curve to intersect the time axis.

Testing Procedure

Ozonizer Test: The specimen for the ozonizer test was the A.S.T.M. triangular strip *(3)* having a length of 12 inches. A spiral mount was designed to vary the strain at the outer edge of the triangular strip from 5 to 40%, with increments of 5% strain between adjacent 1.5-inch lengths of the mounted strip. The radii of curvature of the mount were calculated for the triangular strip assuming that Hooke's law applies to rubber specimens in the region of low strains and that the strain on the outer edge may be expressed in terms of the radius of curvature of the inner surface by

TABLE II—DIMENSIONS OF SPIRAL MOUNT

Strain (%)	Radius of Curvature of Surface of Mount (inch)	Subtended Angle (degree)
5	6.50	13.2
10	3.17	23.4
15	2.06	33.6
20	1.50	42.9
25	1.17	51.6
30	0.99	59.5
35	0.79	66.8
40	0.67	73.6

$$S = \frac{100}{3r + \frac{1}{2}}$$

where S is the strain in the outer edge, and
r is the radius of curvature of the inner surface.

A curve was drawn to consist of the series of arcs defined by the values given in Table II and an aluminum master mount was constructed to conform exactly to the contour of the curve. The test mounts were cut from ¼-inch plywood, sanded to conform to the shape of the aluminium master, and coated with spar varnish to prevent decomposition of ozone at the wooden surface. Observations of the cracking in the mounted specimen indicated that the strain at the outer edge varied in a continuous manner over the length of the specimen. Apparently the inner surface of the triangular strip did not conform exactly to the contour of the spiral mount and, thus, the threshold strain for cracking could be estimated to the nearest 1% strain.

The compound was extruded through a triangular die with a No. ½ Royle extruder and molded in a triangular cavity under pressure. After removal from the mold, the triangular strip was painted with a 25% solution of Vinylite VYNS in acetone to protect the surface of the vulcanizate from handling, oxidation or other damage. Also, the Vinylite inhibits blooming on the surface of the vulcanizate and provides a fresh "surface" for testing. After the Vinylite film was stripped from the specimen, the surface of the latter was marked at intervals to correspond with the theoretical points of change in strain for the mounted specimen. The marking was done by a silver pencil with the help of a scale constructed for this purpose.

The end of the specimen to be at the higher strain was the first to be bound to the spiral mount with aluminum wire. The specimen was bent around the spiral mount taking care to avoid frictional contact between the mount and the inner surface of the specimen. Then, the low-strain end of the specimen was bound into position. A photograph of the completed assembly is shown in Figure 1.

FIG. 1—Triangular strip specimen on the spiral mount (side elevation). Numerals indicate the mean strain over the indicated length of the specimen.

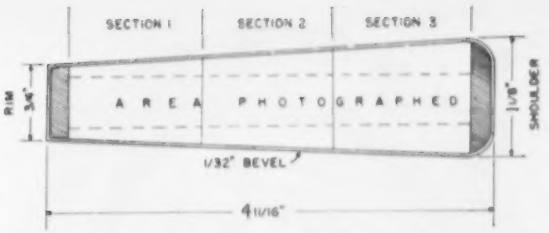

FIG. 2—Schematic drawing of sidewall strip specimen. (Thickness: 0.030-inch).

The mounted specimens were conditioned at room temperature for 24 hours in an ozone-free atmosphere and suspended from racks in a modified Bush Ozonator *(5)*, in an atmosphere containing 25±5 parts of ozone per hundred million parts of air at 120°F. The specimens were inspected at intervals, usually 24-hour periods, and the approximate time required for the appearance of cracks visible at seven magnifications was noted for each strain region. For photographic purposes, the triangular specimens were removed after an exposure of 300 hours in the ozonizer, detached from the spiral mount, and placed in a rack where they were elongated 20%. A scale showing the boundaries of the strain regions was placed in the background so that the threshold strain might be read directly from the photograph.

Sidewall Test: A schematic drawing of the sidewall specimen is shown in Figure 2. In order to facilitate the attachment of the specimen to the sidewall surface and to minimize strain effects due to the thickness of the specimen, the latter value was maintained at 0.030-inch. The edges of the specimen were bevelled in order to reduce any tendency for them to tear free from the tire surface at the edge of the specimen. The specimen was molded by placing a sheet of the compound over a metal insert located in the cavity of a flash-type mold. Following the cure, the test surface of the specimen was

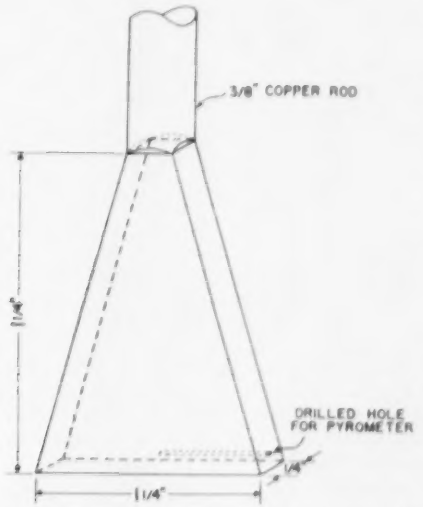

FIG. 3—Soldering iron attachment for vulcanization of strip specimens to the sidewall.

FIG. 4—Sidewall specimens mounted on tire sidewall.

coated with the solution of Vinylite VYNS and the specimen was stored at room temperature in an ozone-free atmosphere.

A 6.70-15 tire, equipped with a butyl inner tube, was used in the service test. Lettering and other projections were buffed from the sidewall to leave a regular surface, suitably roughened for cementing. The wider end of the specimen was first vulcanized to the sidewall near the shoulder of the tire using a commercial vulcanizing cement. The vulcanization was effected by means of a soldering iron equipped with the special copper foot shown in Figure 3. The soldering iron was clamped to a rod that was pivoted at one end and it was pressed onto the specimen at the desired position under a dead load suspended from the opposite end of the rod.

Normally, the cure was started with the soldering iron cold and the applied voltage was set so that the temperature reached 380°F. at the end of the 30-minute curing cycle. The underside of the specimen and the surface of the sidewall were coated with a "cold-patch" cement and, after air-drying for ten minutes, the specimen was rolled into position on the tire.

When all the specimens had been cemented to the sidewall, the Vinylite films were stripped off and the tire was mounted on the rim and inflated to 27 p.s.i.g. at 77°F. The position of the specimens on the sidewall was such that the narrow ends of the specimens were gripped between the rim and the heel of the bead of the tire. A photograph of the assembly is shown in Figure 4.

After a rest period of 24 hours, the tire was mounted on the left front wheel of a 1952 Ford, four-door sedan. During the test period the car was driven in the industrial and residential areas of Sarnia at moderate speeds. The tire was removed from the car at intervals of seven days, washed with water and inspected for cracks under seven magnifications. The strain in the sidewall specimen increases from the rim to the shoulder position and the inspections were made in the three regions indicated in Figure 2. The test covered a period of 56 days, between May 3rd and June 28th, 1955, a period during the year when the more severe cracking conditions prevail in this area.

Following this service period, the specimens were removed from the tire and cut to obtain a ½-inch wide strip down the central portion of the specimen. This strip was elongated 20% and attached to Plexiglas to be photographed.

Results

The results of the microscopic study are summarized in Table III. Recipe No. 1, a vulcanizate that contained no Improved Sunproof Wax or Santoflex AW, showed no induction period, and had the highest number of cracks per square inch of surface area; the cracks grew at a fast rate in spite of the fact that any one crack was rapidly terminated by approaching an adjacent crack and, hence, could not grow very long. The addition of wax did not appear to affect the induction period of cracking and had only a minor effect upon the growth rate of a crack once it was formed. Increasing amounts of Improved Sunproof Wax did reduce the number of cracks formed per square inch of surface and this is consistent with the theory that wax acts as a protective surface film.

The addition of Santoflex AW resulted in an induction period in the formation of cracks and reduced the number of cracks to a slightly greater degree than an equal weight of wax. Further, it caused a greater reduction in the rate of crack growth than did the wax.

The most interesting observation was that a combination of Improved Sunproof Wax and Santoflex AW provided a longer induction period, fewer cracks, and a lower rate of crack growth than an equal weight of either

TABLE III—INFLUENCE OF IMPROVED SUNPROOF WAX AND SANTOFLEX AW ON THE INDUCTION PERIOD, GROWTH RATE OF CRACKS, AND NUMBER OF CRACKS IN STRIP SPECIMENS

Recipe No.	Improved Sunproof Wax (PHR)	Santoflex AW (PHR)	Induction Period (hours)	Rate of Growth (in./hr. x10⁵)	Number of Cracks (per sq. in.)
1	0.0	0.0	0	12.5	52500
2	0.0	0.5	0	4.5	19500
3	0.0	1.0	0	2.5	10600
4	0.0	1.5	4	4.2	3560
5	0.0	2.0	16	10.0	17
6	0.5	0.0	0	12.5	28400
7	0.5	0.5	0	(17.9L)	1240(40L)
8	0.5	1.0	4	5.7(19.2L)	1360(150L)
9	0.5	1.5	38	13.9	5
10	0.5	2.0	—	—	—
11	1.0	0.0	0	5.2	17700
12	1.0	0.5	0	5.4	4700
13	1.0	1.0	22	—	2
14	1.0	1.5	52	—	0.5
15	1.0	2.0	—	—	—
16	1.5	0.0	0	6.0	5200
17	1.5	0.5	4	6.2	850
18	1.5	1.0	38	—	0.5
19	1.5	1.5	—	—	—
20	1.5	2.0	—	—	—
21	2.0	0.0	0	8.3	21
22	2.0	0.5	40	19.2	2
23	2.0	1.0	—	—	—
24	2.0	1.5	—	—	—
25	2.0	2.0	—	—	—

(—) indicates no cracks formed in 150 hours exposure in ozonizer. (L) indicates large, deep cracks.

TABLE IV—EFFECT OF IMPROVED SUNPROOF WAX AND SANTOFLEX AW

Recipe No.	Improved Sunproof Wax (PHR)	Santoflex AW (PHR)	Threshold Strain (%)	Ozonizer Test: Time to First Observed Crack (hrs.) at Strain (%) 0-10	10-20	Sidewall Test: Time to First Observed Crack (days) at Section 1	2	3
1	0.0	0.0	4	24	24	7	7	7
2	0.0	0.5	5	24	24	7	7	7
3	0.0	1.0	6	24	24	7	7	7
4	0.0	1.5	8	48	24	7	7	7
5	0.0	2.0	10	120	24	7	7	7
6	0.5	0.0	2	24	24	7	7	7
7	0.5	0.5	5	48	24	21	21	7
8	0.5	1.0	8	48	24	21	7	7
9	0.5	1.5	13	120	24	21	21	7
10	0.5	2.0	13	120	24	21	21	14
11	1.0	0.0	2	24	24	49	21	21
12	1.0	0.5	7	48	24	>56	49	49
13	1.0	1.0	8	48	24	35	28	21
14	1.0	1.5	13	120	24	42	35	35
15	1.0	2.0	18	>300	48	>56	56	49
16	1.5	0	3	24	24	35	35	35
17	1.5	0.5	8	24	24	49	49	49
18	1.5	1.0	8	24	24	>56	56	49
19	1.5	1.5	14	>300	48	49	49	49
20	1.5	2.0	17	>300	24	49	49	49
21	2.0	0.0	12	300	48	35	35	35
22	2.0	0.5	12	216	48	49	49	49
23	2.0	1.0	13	>300	48	>56	>56	>56
24	2.0	1.5	15	>300	48	49	49	49
25	2.0	2.0	17	>300	120	>56	>56	>56
26	3.0	0.0	>40	>300	>300	>56	>56	>56
27	6.0	0.0	>40	>300	>300	>56	>56	>56

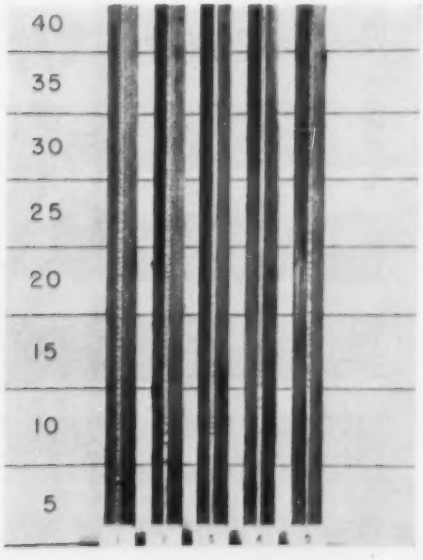

FIG. 5—Effect of Santoflex AW (ozonizer test).

Recipe	Loading (PHR)
1	0.0
2	0.5
3	1.0
4	1.5
5	2.0

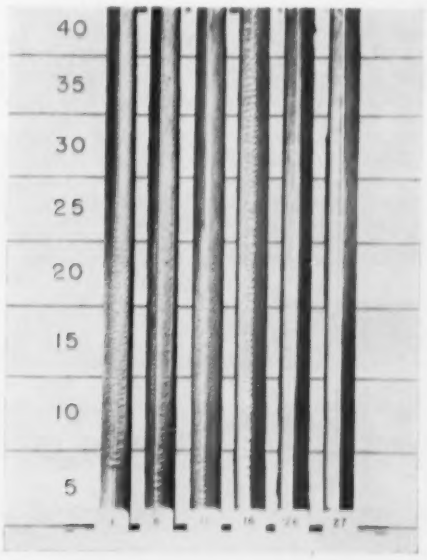

FIG. 6—Effect of Improved Sunproof Wax (ozonizer test).

Recipe	Loading (PHR)
1	0.0
6	0.5
11	1.0
16	1.5
26	3.0
27	6.0

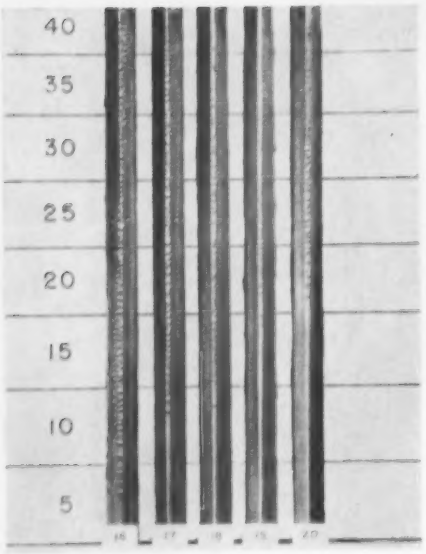

FIG. 7—Effect of Santoflex AW with 1.5 PHR of Improved Sunproof Wax (ozonizer test).

Recipe	Santoflex AW (PHR)
16	0.0
17	0.5
18	1.0
19	1.5
20	2.0

material alone. These tests indicate that an equal weight ratio of these two materials is about the optimum to prevent cracking with this recipe with the probability that a slightly higher proportion of wax would be beneficial in such static service.

The effect of various combinations of Improved Sunproof Wax and Santoflex AW on the vulcanizate performance in the ozonizer and sidewall tests is shown in Table IV.

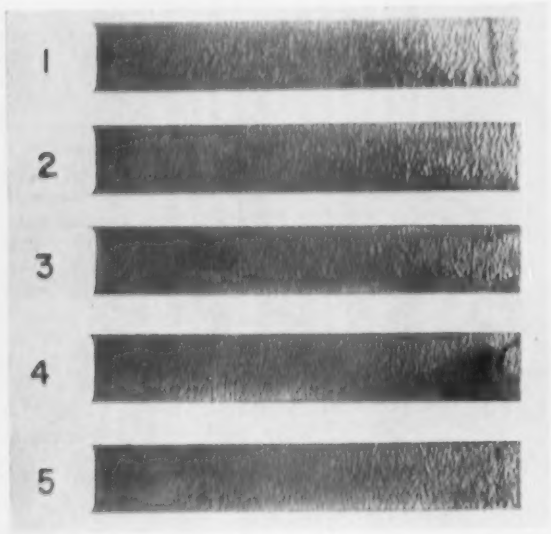

FIG. 9—Effect of Santoflex AW (sidewall test).

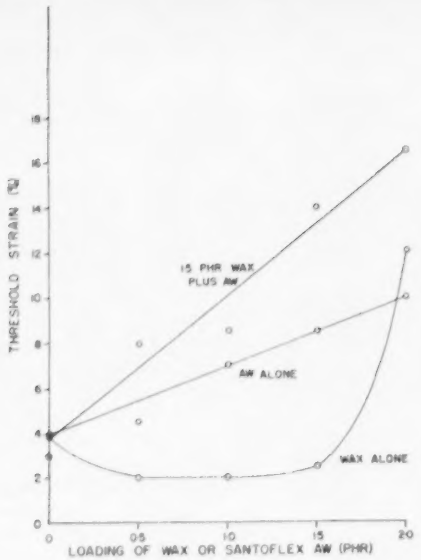

FIG. 8—Effect of Improved Sunproof Wax and Santoflex AW on the threshold strain (ozonizer test).

The spiral mount provided a good means of estimating the threshold strain. Increasing amounts of Santoflex AW in the absence of wax (Figure 5) increased the threshold strain in a linear manner but an increase in the loading of wax (Figure 6) produced no significant

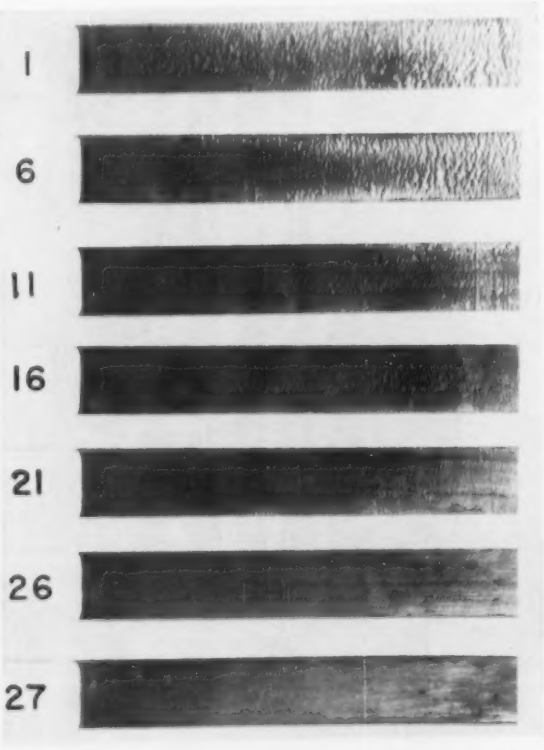

FIG. 10—Effect of Improved Sunproof Wax (sidewall test).

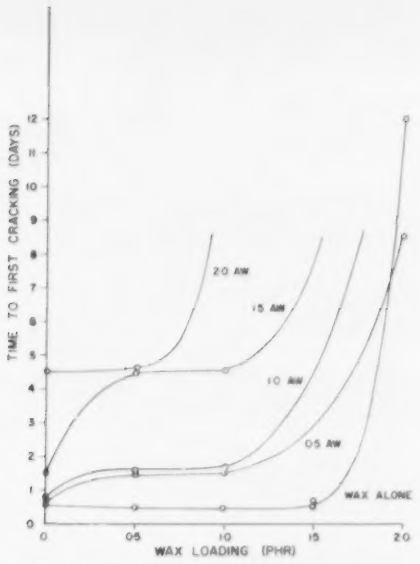

FIG. 11—Effect of Improved Sunproof Wax and Santoflex AW on the time to first cracking (ozonizer test). (Strain region 0-10%).

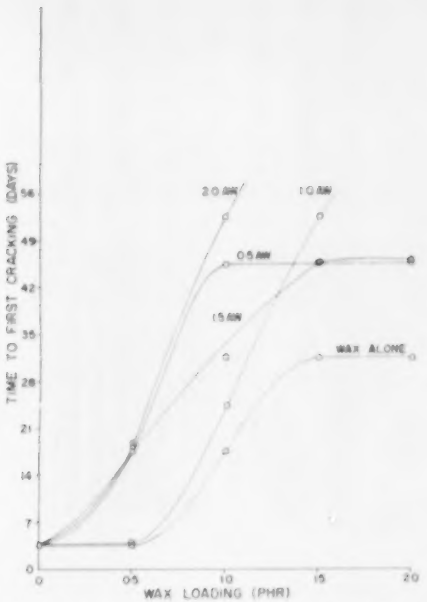

FIG. 12—Effect of Improved Sunproof Wax and Santoflex AW on time to first cracking (sidewall test).

change in the threshold strain until at least two parts had been added. The simultaneous addition of wax and Santoflex AW (Figure 7), however, produced a marked increase in the threshold strain at moderate loadings. These effects are summarized in Figure 8. If the maximum strain existing in the surface of the sidewall is taken to be 10%, then a crack-free condition would be obtained by the addition of more than two parts of either Improved Sunproof Wax or Santoflex AW, or by a combination of more than one part of each of these materials.

The photographs of the sidewall strips (Figures 9 and 10) show the recipe number at the end of the strip that was adjacent to the rim of the tire and, hence, at the lower strain. These photographs indicate that either wax or Santoflex AW produced an increase in the threshold strain, but that the effect was only significant in the case of Improved Sunproof Wax. It had been considered likely that, under intermittent dynamic service, a thick wax film would be more subject to mechanical failure than a thin film. In fact, however, the compounds containing 3 (No. 26) and 6 (No. 27) parts of wax showed no cracking after 56 days on the sidewall. This occurred despite weekly washing of the specimens which, in itself, might be expected to disrupt the wax film on the surface of the vulcanizate. Possible explanations of the effectiveness of the wax are that (a) the low dynamic strain present in the sidewall is not sufficient to cause rupture of the film or (b) that the surface film can be rapidly reformed during dynamic cycling at low strains, and at tire operating temperatures, provided a sufficient loading of wax is present in the recipe.

TABLE V—EFFECT OF ANTIOZIDANT IN ABSENCE OF WAX

Recipe No.	Ingredient	Loading (PHR)	Threshold Strain (%)	Ozonizer Test: Time to First Observed Crack (hrs.) at Strain (%) 0-10	10-20	Sidewall Test: Time to First observed Crack (days) at Section 1	2	3
1	Santoflex AW	0.0	4	24	24	7	7	7
2	Santoflex AW	0.5	5	24	24	7	7	7
3	Santoflex AW	1.0	6	24	24	7	7	7
4	Santoflex AW	1.5	8	48	24	7	7	7
5	Santoflex AW	2.0	10	120	24	7	7	7
28	U.O.P.-28	0.5	3	24	24	7	7	7
29	U.O.P.-28	1.0	5	24	24	21	7	7
30	U.O.P.-28	1.5	24	>300	>300	42	42	21
31	U.O.P.-28	2.0	>40	>300	>300	>56	49	49
32	NA-22	0.5	1	24	24	14	7	7
33	NA-22	1.0	5	24	24	14	7	7
34	NA-22	1.5	13	>300	24	14	7	7
35	NA-22	2.0	12	>300	24	7	7	7
36	PBNA	2.0	4	24	24	7	7	7

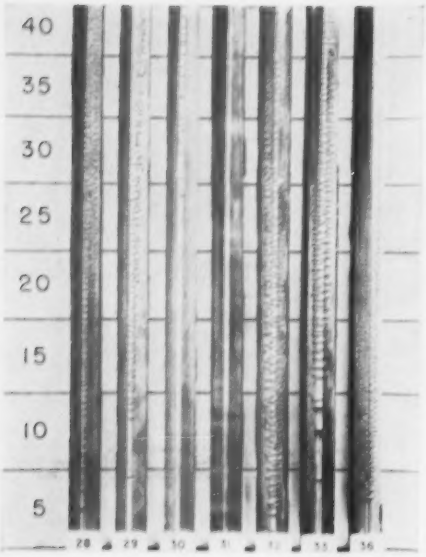

FIG. 13—Effect of various types of antiozidants in the absence of wax (ozonizer test).

Recipe	Ingredient	Loading (PHR)
28	U.O.P.-88	0.5
29	U.O.P.-88	1.0
30	U.O.P.-88	1.5
31	U.O.P.-88	2.0
32	NA-22	0.5
33	NA-22	1.0
36	PBNA	2.0

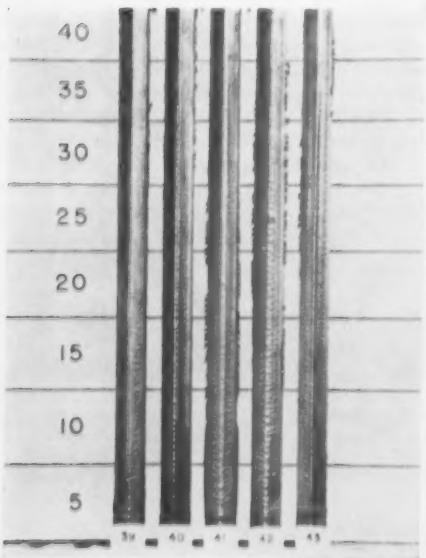

FIG. 15—Effect of various plasticizers at a 10-volume loading in the absence of wax (ozonizer test).

Recipe	Ingredients
39	Aromatic Oil
40	Naphthenic Oil
41	Paraffinic Oil
42	Sundex 53
43	Bardol B

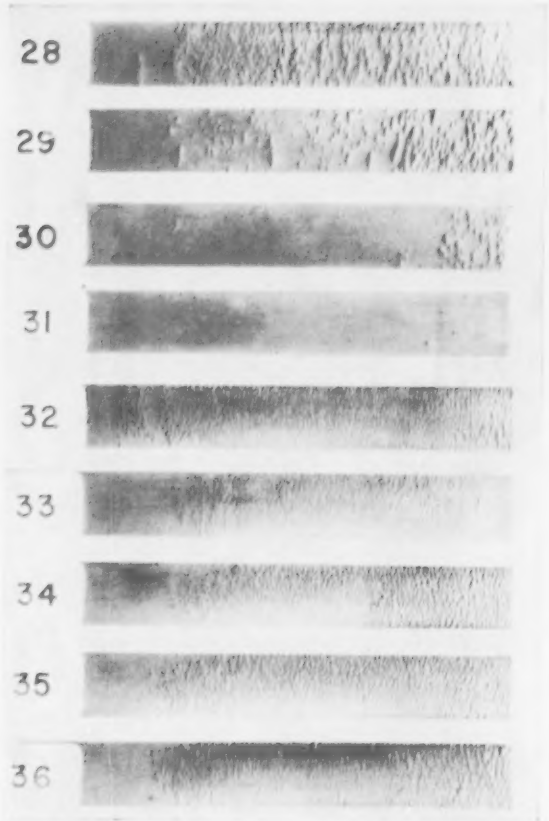

FIG. 14—Effect of various types of antiozidant in the absence of wax (sidewall test).

The effect of these ingredients on the time to form the first crack is summarized in Figure 11 for the ozonizer test and Figure 12 for the sidewall test. The time to produce the first crack was taken as mid-way

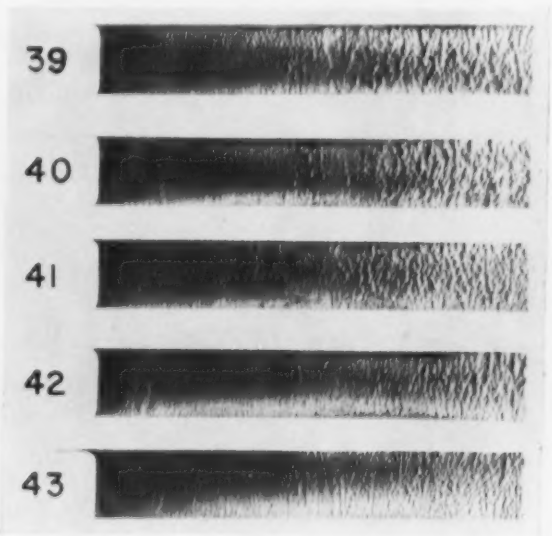

FIG. 16—Effect of various plasticizers in the absence of wax (sidewall test).

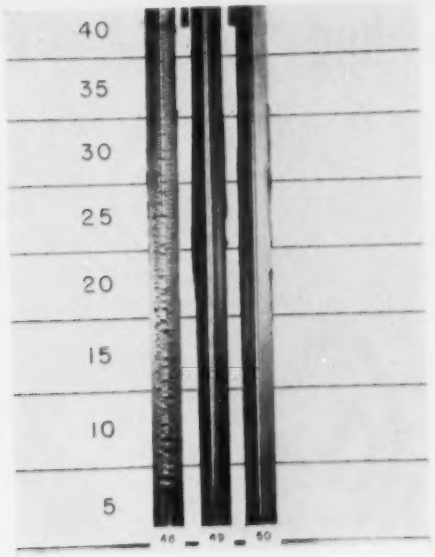

FIG. 17—Effect of antiozidant on plasticized Alfin tread compound (ozonizer test).

Recipe	Ingredient	Loading (PHR)
48	(Base Recipe)	0
49	Santoflex AW	4
50	U.O.P.-88	4

through the period preceding the first observation of the presence of cracks. In the ozonizer test, Improved Sunproof Wax had little effect in delaying the formation of cracks at loadings below 1.5 PHR. Santoflex AW did increase the time for cracking to occur and this effect was most pronounced when the compound contained both wax and antiozidant. In the sidewall test, the same trends were observed but the beneficial effect of wax was more apparent and became significant at lower loadings of wax. The difference in the time to cracking in these two tests, of course, was largely influenced by the difference in ozone concentration and ambient temperature.

Similar tests were carried out with U.O.P.-88, NA-22, and PBNA (Table V, Figures 13 and 14). In contrast to the action of Santoflex AW, U.O.P.-88 produced a large increase in the threshold strain in both the ozonizer and sidewall tests. Two PHR of this material in the absence of wax was sufficient to prevent the formation of cracks in the vulcanizate for the duration of the test. NA-22 showed a unique effect in that it reduced the number of cracks to a low level at all values of strain and, in this respect, paralleled the behavior of a protective wax. It produced an increase in the threshold strain in the ozonizer test but, under dynamic conditions, no improvement was apparent in this property. PBNA was included in these tests as a representative antioxidant and no improvement was observed for this material in the absence of wax for either test condition.

Petroleum oil plasticizers are being used in large volumes by the rubber industry and, in general, they do not prevent crack formation. Samples of oils containing a high proportion of aromatic, naphthenic, or paraffinic constituents were compounded in the base recipe at a ten-volume loading as a replacement for the Circosol 2XH and in the absence of wax (Figures 15 and 16). There was no significant difference in the

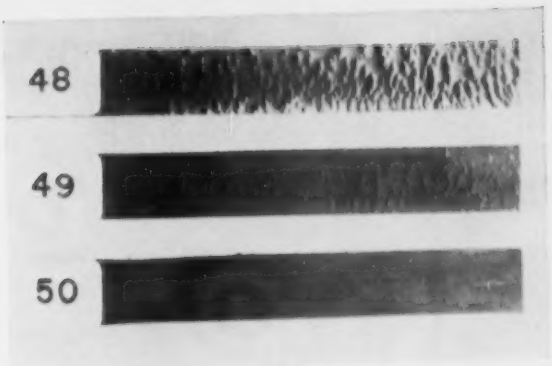

FIG. 18—Effect of antiozidant on plasticized Alfin tread compound (sidewall test).

cracking behavior of these vulcanizates. The recipe containing Bardol B (No. 43) showed no significant improvement although such had been observed when it was used in a butyl rubber compound *(5)*.

With the advent of oil-enriched GR-S polymers, some concern has been expressed about the weathering resistance of such vulcanizates. During the present test program an opportunity was presented to test the effect of antiozidants upon the cracking of an HAF-Alfin tread compound containing about 45 PHR of petroleum oil (Figures 17 and 18). It was found that four parts of either Santoflex AW or U.O.P.-88 inhibited cracking for over 300 hours in the ozonizer test. In the sidewall test, Santoflex AW was somewhat less effective than U.O.P.-88 but a vulcanizate containing the latter at a four part loading showed no cracks after 56 day's exposure. The use of an antiozidant at such loadings would be an expensive but effective method of combating weather cracking. More extensive tests are in progress to examine the cooperative effect of wax and antiozidant in the oil masterbatch compounds.

Summary

Laboratory methods have been developed to examine the effect of compounding ingredients upon the threshold strain, induction period, and the number and growth rate of cracks resulting from the exposure of vulcanizates to ozone in a strained condition. A method of estimating the weathering characteristics of experimental vulcanizates on sidewalls was devised and a comparison is shown for the results of the two tests.

A wax surface film was found to be more effective in service than would be indicated by laboratory tests. The selection of the proper ratio of wax and antiozidant provided good protection from cracking in a service test of sidewall vulcanizates.

ACKNOWLEDGMENTS

The authors wish to express their thanks to Polymer Corporation Limited for permission to publish this paper. The experimental assistance of W. M. Pruliere is gratefully acknowledged.

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(4) Crabtree, J., and Kemp, A. R., *Ind. Eng. Chem.*, Vol. *38*, p. 278 (1946).
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Reclaimed Rubber

Report of a Symposium Sponsored by the Connecticut Rubber Group

THE Spring Meeting of the Connecticut Rubber Group, held on May 25th at the Actor's Colony Inn, Seymour, Conn., featured a symposium on "Reclaimed Rubber". Thomas Fitzgerald (Naugatuck Chemical) served as moderator and the panel members included: H. D. Glenn (Naugatuck Chemical), Clyde F. Hoover (Pequanoc Rubber), F. E. Traflet (Pequanoc Rubber), John Ball (Midwest Rubber Reclaiming), William Boyd (Xylos Rubber), E. B. Busenberg (Goodrich) and Croft Huddleston (U. S. Rubber Reclaiming). The questions addressed to the panel ran the full gamut of reclaim technology. There follows herewith a full report of the questions asked and the replies of the panel members:

Question—What is reclaim?

Answered by Mr. Ball: Reclaimed rubber is the product resulting from the treatment of ground vulcanized scrap rubber tires, tubes and miscellaneous waste rubber articles by the application of heat and chemical agents whereby a substantial "devulcanization" or regeneration of the rubber compound to its original plastic state is effected, thus permitting the product to be processed, compounded and revulcanized. Any fiber present in the scrap is removed either chemically or mechanically.

Reclaiming is essentially depolymerization: the combined sulfur is not removed. Indeed, it would probably be disadvantageous to remove this combined sulfur, even if it could be done commercially, because it is believed that many of the advantages of reclaim are connected with the presence of combined sulfur.

The product is sold for use as a raw material in the manufacture of rubber goods with or without admixture with natural or artificial rubber. First quality whole tire reclaim contains about 50 percent of rubber hydrocarbon by weight. The non-rubber component consists of valuable softeners, zinc oxide, antioxidant and carbon black, all of which are substantially unchanged by the reclaim manufacturing operations, and may be counted upon therefore to function essentially as virgin materials. Reclaim also speeds the cure of GR-S with freedom from scorchiness, and this accelerating value can be translated into definite cost savings.

Reclaimed rubber is a high-grade compounding ingredient, attractive in price, imparting excellent properties both to uncured and cured compounds. It is used, not only to lower volume cost, but also to lower processing costs and to reduce seconds or defective goods.

Question—How is reclaim manufactured? What methods are commonly employed?

Answered by Mr. Huddleston: The main volume of reclaim is made by four basic processes, as follows:

Digester Process: Since the advent of GR-S into tire scrap, which is the bulk of our rubber source, the Digester Process has undergone quite a change. The early days of the Digester Process was alkali, but GR-S acts differently from natural rubber in an alkali cook. Instead of becoming soft and plastic, as natural rubber does, it hardens and you end up with a mass, or mess, something like sand and chewing gum. The GR-S separates out as tailings on the refiners, and since the percentage of GR-S in today's scrap tire is almost 50/50 with natural rubber, smooth finished reclaim is a very small yield.

For this reason, in the fifteen years since synthetic rubber took its place in the rubber industry, the Digester Process has been converted to so-called neutral materials, such as zinc chloride and calcium chloride. These act as defiberizers in the same way as the sodium hydroxide, yield a reclaim which is as smooth as the old natural rubber one, and is satisfactory for use in rubber compounds. The neutral reclaims tend to be a little stiffer and shorter, but physicals are equivalent. The cracked rubber scrap is charged to the digester solution and subjected to a cook for some period of time. The devulcanized mass is blown down, washed, put through a series of dryers and worked on, or in, a massing device. The reclaim is strained and refined.

Pan Process: The Pan Process has been in use almost since the birth of the vulcanization of rubber. The scrap rubber is ground up and put into a pan with or without additional reclaiming agents, and is subjected to steam pressure. The pan cake is then removed, passed through a breaker, and worked on, or in, massing devices and then refined until it is a smooth reclaim. Today, the scraps subjected to the Pan Process are not limited, as they were in the past, to fabric-free scraps. Whole tire scrap could be reclaimed in the pan, but the fiber had to be included in the finished reclaim.

Now, using the air separation method, fiber can be removed from the rubber by mechanical means. The tires are cracked and reduced in size until the fiber is entirely separated by the dry air. The separated rubber is ground to a 30 or 40 mesh size, and pan reclaimed.

Reclaims using the finely ground rubber accentuate the excellent properties and characteristics of pan reclaims. Pan reclaims will always have a very definite place in the reclaiming industry.

Reclaimator Process: The 30 or 40 mesh ground rubber from the air separation process is mixed with reclaiming agents and passed through an extrusion type machine, where it is subjected to heat and pressure. The subsequent reclaim is extruded from a specially designed head and can be refined, extruded, or powdered. The Reclaimator Process can be varied in a great number of ways, and is therefore the most versatile, as well as the only continuous, method of making reclaim. Reclaims made on the Reclaimator are softer and more plastic than reclaims made by the other processes.

Lancaster-Banbury Process: Using a specially-built Banbury with close clearances and running it at high speed (45 to 50 rpm), cracked scrap can be made into

reclaimed rubber. It is sometimes necessary to add load, to generate friction heat. This is a batch process, the reclaims being shorter and drier than those made by the other three methods. The dumped batch can be refined until smooth.

There are other methods of manufacturing reclaimed rubber. Some are used on a small scale, while others have been forgotten, but as long as scrap is generated, there will always be a reclaimed rubber—and there will always be new ideas for making it.

Question—What types of reclaim are commercially available?

Answered by Mr. Busenberg: A very large percentage of the tonnage of reclaimed rubber produced today is based on scrap tires and inner tubes. Whole tire reclaims may be based on passenger tires, truck tires or a blend of the two. Truck tires are commonly cut up and split into tread and carcass portions by manufacturers of auto parts, such as shims, or by dealers or reclaimers. The tread portion is used to make high black tread or peel reclaim, useful in such products as camelback, heels, soles and belt covers.

The carcass portion of large size truck tires is high in natural rubber hydrocarbon and may be reclaimed by the alkali or neutral process. Carcass reclaims are quite popular in adhesives and water dispersions. A limited amount of light grey truck carcass scrap is still available from segregated split stock.

Natural rubber inner tube scrap is available to the reclaimer in black and red colors with supply slowly diminishing. Butyl inner tube reclaim is a popular and very interesting product. Miscellaneous scrap, such as curing bags and mechanical scraps, if available in sufficient flow, are reclaimed as such or incorporated in blends for specific purposes. There is always demand for light-colored reclaims if adequate supply of scrap can be developed at prices which facilitate successful competition. Such scraps as thread, foam sponge scrap and light-colored soling are reclaimed.

These basic reclaims are modified by the reclaimer with additives which may have very profound effects on texture and properties of reclaims for specialized uses. For this reason the number of grades in a reclaimer's line of products will fan out to 50 or 100 grades if no control is exercised. From the viewpoint of production, cost of clean-ups, maintenance of warehouse stocks, etc., this trend is somewhat undesirable, costly to reclaimer and customer.

The slow trend to automation in batch compounding methods has created some demand for reclaim in powdered or pelletized particulate form. Sizeable tonnages of pre-mixes are now being made. Here the reclaiming plant adds sizeable additions of compounding ingredients which are dispersed into the reclaim through the refining operations. Many of the questions to be discussed later bring out necessary further details regarding reclaim grades.

Question—How is reclaim used in transportation items?

Answered by Mr. Boyd: There were 167,680 long tons of reclaimed rubber used in the transportation segment of the rubber industry in 1955 because reclaimed rubber is an important source of rubber hydrocarbon at a lower cost than other sources of rubber hydrocarbon. The transportation segment of the rubber industry uses more than half of the reclaimed rubber produced.

The largest use of reclaimed rubber, of course, is in tires. Most, if not all, First Line passenger tires produced by the major companies contain reclaim, since it is possible to give the customer more miles per dollar by replacing new rubber with reclaimed rubber. Different types of reclaim are used in various sections of the tire but the source of the raw material is the same, namely, scrap tires and tire parts.

Properties of the various tire reclaims are dependent on the following factors: (1) Type of scrap; (2) Devulcanizing oils; (3) Defiberizing agent; (4) Methods of reclaiming; (5) Pigments added to devulcanized scrap, and (6) Smoothness.

Neutral whole tire or modified whole tire reclaims are consumed in the largest quantities, but other types are also used, such as tread reclaim, commonly known as peeling reclaim. This is used in camelback, bead stock and sidewall stock.

Another special type of reclaim is known as nonstaining type. It is used in the manufacture of white sidewall tires as well as mechanical goods products, such as steering wheels and automobile floor mats. Such a reclaim is made from selected tire scrap devulcanized with oils that do not stain. Some nonstaining reclaims contain pigments which further reduce the staining of the reclaim.

There are, of course, wide differences in processes at the various reclaiming plants but all changes and any new reclaims developed are thoroughly tested in the laboratory before being released. In addition to this, indoor tire tests as well as fleet tests are run on tires which contain new or modified reclaim. Indoor tire tests usually show: (a) Crown break; (b) Tread separation; (c) Radial cracking; (d) Running temperature, and (e) Failing speed. Fleet tests generally show: (a) Tread wear; (b) Tread cracking; (c) Any construction defects; (d) Tread separation; (e) Tire growth; (f) Running temperature; (g) Ply separation; (h) Weathering, and (i) Radial cracking.

Reclaimed rubber is used in many First Line tires because of a lower cost without any corresponding drop in quality. Second and Third Line tires usually contain larger quantities of reclaimed rubber. The inherent advantage of reclaimed rubber, such as good aging, lower power consumption, rapid breakdown, faster extrusion speeds, shorter Banbury mixing cycle, and uniformity, may not be as important to the tire manufacturer as they are to a manufacturer of high reclaim content products, such as mats, battery boxes, semi-pneumatic tires, etc. Nevertheless, the stable price and supply of reclaimed rubber means that it will always be an ingredient of tires.

Most butyl rubber tubes contain butyl rubber reclaim, which is used both for cost reduction and improved processing. This application is now only a small consumer of reclaimed rubber. Butyl reclaim is used in many automotive mechanical goods applications; considerable quantities are used in radiator hose and extruded gaskets. Other reclaims—whole tire, modified whole tire, specialty reclaims—are being used in large quantities in floor mats, throw-in mats, semi-pneumatic tires, and battery boxes.

The reclaimed rubber industry is of vital importance to the automotive industry because it has been uniformly low in cost from year to year. From 1949 to 1956, the pound cost of whole tire reclaim varied between 8 and 10½ cents.

Past and present consumption in actual tonnage and in comparison to new rubber as a raw material is assured. Its use will undoubtedly expand and this expansion will be the result of both continued improvement in the quality and increased familiarity with the properties by rubber goods compounders. Our company, as well as other reclaimed rubber manufacturers, have increased their reclaiming capacity to keep pace with the new developments and requirements of the automobile industry.

In conclusion, I wish to emphasize a statement often heard to the effect that our country's economy is dependent on transportation. This all important transportation rolls at a lower cost because of reclaimed rubber.

Question—Will you tell us in a general way how reclaim is used to advantage in other items, such as heels and soles and friction tape?

Answered by Mr. Hoover: Non-automotive items, such as friction tape, insulated wire, semi-pneumatic tires, and soles and heels, account for approximately 9.5% of the total reclaim consumed.

Reclaims for friction tape differ from those normally produced in elastomer type and tackiness. Natural rubber automotive tires and tubes are most generally used as the basic scrap, with special oil and resin formulations, followed by a heat treatment. Recent developments on friction tape compounds have included an evaluation of butyl rubber reclaim as an additive to natural tube and tire stocks to improve aging characteristics. The retention of tack over prolonged shelf aging is a necessity; therefore, proper selection of reclaiming oils and resins is a critical factor. Probably in no other field are there greater differences in compounding practices than those for friction tape. Combinations of elastomer, reclaims and resins are constantly being evaluated in this item.

For a number of years the insulated wire field used large quantities of so-called natural base tire and boot and shoe reclaims. These types were particularly advantageous once the fiber was removed, and the material heat treated with the necessary oils, then well refined. The filler present contributed to smoothness of the finished material.

Fiber was removed by the acid process, and the neutralized, washed ground rubber was subjected to the necessary oils with a heat treatment. The preliminary treatment, before mixing with oils and subjection to temperatures in excess of 350°F., proved more effective in removing the objectionable fiber and other foreign material than is possible on soft tacky reclaimed particles. This procedure was followed by careful refining to produce an extremely smooth sheet. Subsequent compounding of this reclaim with some new rubber produced compounds that were fast extruding and fast curing with excellent electrical properties.

The introduction of plastics and the trend to thinner insulations, with competitive pricing, has had an adverse effect on the use of reclaim in the insulated wire field. Present usage is restricted to heavier gauge code, automotive and tinsel wire.

Pneumatic automotive tires have been with us a number of years, but the application of the pneumatic principle to materials handling and lawn mower equipment is more recent. The semi-pneumatic or low pressure tire for these applications is becoming highly competitive, and to introduce economies in material and processing costs, reclaim is being utilized. Requirements include freedom from nerve, added tackiness for splicing, and smooth extrusion. Abrasion resistance is also a prerequisite and reclaims containing relatively high percentages of carbon black are applicable. Peel and modified whole tire reclaims demonstrate types regularly employed.

Prior to World War II and the rubber crisis of that period, the largest percentage of soles and heels manufactured were black for maximum wear resistance. Civilian rubber soles and heels (with reservations on the term "rubber"), made during the war, were allowed only the lowest grade reclaims. These were further compounded with high ratios of black to improve wear resistance and as a consequence severe marking problems were encountered. The housewife's resistance to the marking of her floors resulted in the production of non-marking or neutral soles and heels. The amount of black reclaim used today in soles and heels is substantially lower, and is of the peel grade with some regular whole tire. The lighter colored reclaims produced from cellular soling, tan rigid soling reinforced with high styrene resin copolymers, as well as foam sponge and garment scrap, are receiving widespread acceptance in the sole and heel trade.

Summarizing, we may state that reclaims in non-automotive items such as friction tape, insulated wire, semi-pneumatic tires, and soles and heels, consumed approximately 9.5% of the total, or roughly 25,000 long tons, during the calendar year 1955. Reclaims employed consist of so-called specialty reclaims as well as the more standard items, the choice being left to the compounder for his own particular application.

Question—Can you enlarge on what Mr. Hoover has told us, indicating the use of reclaim in such articles as garden hose, water dispersions and solvent cements?

Answered by Mr. Glenn: Reclaim is a well known ingredient in garden hose, belt friction and cover, sheet packing, solvent cements and water dispersions. Its primary importance, particularly for the first three items mentioned, is a combination of economics and improved processing.

Reclaim has been used for years in garden hose because it was an inexpensive source of rubber hydrocarbon. It also affords more uniform extrusion and, thus, faster extrusion rates. This is partially due to the reduced nerve reclaim imparts to hose compound. In addition, it gives a raw stock with high modulus and good mechanical properties, both of which are advantageous to processing. Although use of reclaim in hose has given a lot of ground to vinyl hose, it is apparent that the future of rubber hose looks brighter. This is because vinyl hose has certain limitations in colder climates. More reclaim will be used in garden hose in the future.

Reclaim also contributes to favorable economics in belt friction and cover and sheet packing. It aids in frictioning by helping wet the fabric, and its presence improves calendering. It is generally accepted that belts compounded without reclaim are more difficult to process. In cover, the main purpose of reclaim is to take out nerve. In sheet packing, the incorporation of reclaim gives faster processing and stocks show less creep. There is also some evidence of less blistering when the right reclaim, properly aged, is used.

The use of reclaim in solvent cements is based on somewhat similar attributes. Although such reclaims

are generally the highest priced reclaims, they still present a cost advantage over new polymers used in cements, such as neoprene, Paracril and natural rubber. Along this same line, lower cost solvents can be used with reclaim cements. Further advantages for reclaim in solvent cements are evident in their excellent sprayability for industrial applications, their high level of stability, excellent cohesive strength, and good tack on laid out films. They also bond well to a wide variety of materials, including metals, fabric and wood.

In water dispersions, reclaim was practically the only source of polymer used until recent years. It still enjoys the major share of the business. Here again, cost has been an advantage as well as ease of processing. Water dispersions made from reclaim also show improved aging characteristics at elevated temperatures.

The wide variety of reclaims available will continue to be an important source of elastomer to the commodities described.

Question—Is there any one specific advantage for the use of reclaim?

Answered by Mr. Huddleston: Among the many advantages in using reclaim, the greatest single one is lowered cost. In most cases there is a saving in the volume cost of the compound when reclaim is used, but even when the reduction in compound cost is negligible or non-existent, the saving in processing cost makes the use of reclaim very profitable.

Question—With whole tire reclaim at 10½c and oil-extended GR-S (37½ parts oil) at less than 19c, how is it economical to use whole tire reclaim since the oil-extended GR-S is normally used as 100% hydrocarbon?

Answered by Mr. Blusenberg: These two types of rubber are quite dissimilar in most properties but are in competition with one another in approximately the same price range on a rubber value basis. For some end product uses one or the other is favored because of specific properties for that use. Some end products can be developed around either or a combination.

100 parts of material can be purchased for $19.00 to $19.50 in the case of this oil-extended GR-S. 200 parts of material can be purchased for $21.00 in the case cited for reclaimed rubber. This consists of 100 parts rubber hydrocarbon, 35 to 40 parts of carbon black, approximately 30 to 40 parts plasticizer, and 20 to 30 parts mineral fillers, including zinc oxide. The value of the 100 parts of well-dispersed conventional loading cannot be overlooked. In highly loaded and extended one-step batches the use of whole tire reclaim with predispersed materials gives almost double bulk of starting batch matrix for mixing in the Banbury or on a mill.

Costs for mixing and accelerator costs are in favor of the whole tire reclaim. Processing properties and tack properties favor the reclaim for many uses.

The question asked was specifically in regard to whole tire reclaim. It is my opinion that oil-extended GR-S has been much more serious competition in non-black goods versus light-colored reclaims. Due to scarcity of suitable scraps and consequent price, high quality light-colored reclaims are priced in the 15c and 21c price range.

Question—What is the cost of the RHC of reclaim?

Answered by Mr. Ball: You will sometimes hear it said that if first quality whole tire reclaim costs 10½ cents per pound, and contains 50 percent RHC, then the RHC of the reclaim costs 21 cents per pound. This would be true provided that the softeners, zinc oxide, antioxidant and carbon black which comprise the non-rubber component are assumed to be worthless. Actually, as pointed out earlier, these valuable ingredients come through the reclaim manufacturing operations essentially unchanged, and are therefore substantially as potent as if they were still virgin materials. Considering the delivered costs of these various ingredients, it is not unreasonable to assume a cost of 5c per pound for the entire non-rubber component. If the RHC is 50 percent by weight of the total reclaim, its cost, then, is 21c less 5c, or 16c per pound.

Question—Can a proportion of reclaim be used at a cost advantage and still maintain properties of a compound?

Answered by Mr. Boyd: Yes, as there are many compounds whose physical properties requirements can be adequately met by formulas utilizing reclaim. When one has compounds of medium physical properties, reclaim can be used in substantial amounts reducing the volume cost of such compounds without lowering their physical properties.

Question—I believe you have had some experience compounding reclaim into specification products. Have you anything to add to what Mr. Boyd has just told us about the use of reclaim in such formulations without loss of quality?

Answered by Mr. Blusenberg: One of the puzzling things to the reclaimer is that some compounders use reclaim in all specifications compounds and praise the advantages, while others claim they cannot. Almost any reasonable specification can use reclaim in good percentages. Citing only two examples, a factory-approved R-620-AB compound uses 27.25% of the RHC as whole tire reclaim, and a factory-approved R-420-AB compound uses 33.6% of the RHC as whole tire reclaim.

Question—Are accelerator revisions necessary or desirable to compensate for present ratios of natural and synthetic in whole tire reclaims?

Answered by Mr. Dusenberg: Only minor variations, if any, are necessary. I would like to point out that reclaimed rubber and compounds utilizing it can be cured with a wide variety of sulfur and accelerator ratios. Reclaimed rubber in commercial formulations is not very sensitive to minor accelerator adjustments. I might say that the Technical Committee of the Rubber Reclaimers Association is now studying variations of the Standard Reclaimers Test Recipe for test curing straight reclaim to see if accelerator variations from the recipe (which has been used for a number of years) might better reflect true physical properties of present reclaims.

Question—Although it is said that reclaim as delivered contains a moderate amount of zinc oxide, a reclaim-bearing stock sometimes suffers due to insufficient zinc oxide to properly activate the cure. Do increments of added zinc oxide benefit physical properties before and after aging?

Answered by Mr. Glenn: There is often enough zinc oxide in reclaim to give an adequate cure. However, recently, and probably due to the growing tendency to hold zinc oxide to a minimum in the original compounds, there is evidence of zinc oxide deficiency in some reclaims. This can be remedied by the addition of 0.5 to 1.0 parts of zinc oxide on the reclaim rubber hydrocarbon. In addition, of course, normal amounts of zinc oxide should be added to activate the cure of new polymer in the compound.

Question—What accelerator and sulfur adjustments are necessary to cure reclaim as compared to raw polymer, i.e., GR-S reclaim versus GR-S polymer and natural rubber reclaim versus natural rubber?

Answered by Mr. Busenberg: In general, mixed elastomer reclaims or combinations of these reclaims and GR-S polymer cure faster than GR-S polymer; therefore, a reduction in accelerator is possible. All reclaims are much faster than GR-S. In regard to natural rubber reclaims versus natural rubber, some natural rubber reclaims are very fast in rate of cure. Neutral process reclaims are slightly slower than natural rubber. On the average, slightly higher sulfur ratios can be used with sizeable increments of reclaimed rubber without bloom. Reclaims, although fast in rate of cure, are free from scorching problems and, in general, safe processing.

Question—What are the present uses of reclaimed rubber in the flat sponge field?

Answered by Mr. Hoover: Reclaimed rubber is currently being used in sponge backing for rugs as well as extruded channel rubber, kneeling pads, etc. Satisfactory automotive sponge to R11 and R12 specifications have been produced with certain percentages of reclaimed rubber. Reclaim again reduces mixing cycles and contributes to a smoother calendered sheet and extruded preparatory material. The inclusion of reclaim tends to iron out variations in blow that might otherwise be present. Twenty to twenty-five percent of the rubber hydrocarbon of the formula may be replaced with an equivalent amount of reclaim hydrocarbon. Flat milling, well plasticized reclaims are prerequisites for these applications.

Question—Does reclaim affect adhesion to steel or brass for better or worse?

Answered by Mr. Boyd: It has been our experience that the use of reclaim in an adhesion compound has no deleterious effect and in many cases improves the adhesive bond. This general statement applies to brass-plated steel, chemical adhesive bond to steel, or adhesion to solid brass. In using reclaim in such stock, one has to consider other properties than just the adhesive qualities.

Question—How could reclaim be adapted to use on thin wall wire insulations?

Answered by Mr. Hoover: We do not consider reclaim, under present circumstances, to be adaptable to thin wall wire insulations. Extrusion speeds, processing and curing costs, plus electrical requirements, practically preclude its use. Substantial quantities of reclaim, however, are still being used in code grade, tinsel wire and automotive wire as well as heater cord. In the latter case, the rubber insulation is frequently not vulcanized.

Question—What is the availability of neoprene reclaim and what is the outlook for its volume production in the near future?

Answered by Mr. Boyd: All reclaims are dependent on the availability of satisfactory scraps. At the present time, this is a problem with neoprene reclaims. Due to this fact it does not appear likely that one can expect light-colored neoprene reclaims to be available in large quantities in the near future. As to dark-colored neoprene reclaims, scraps that are available are such that neoprene reclaims can be used for some applications. However, if one confines his remarks to the wire and cable industry then such a reclaim is limited to jacket covering rather than insulation. In this latter application the scrap needed is pure gum neoprene type and such a scrap is not available in large quantities.

Question—What types of reclaim dispersions are available and how are they used?

Answered by Mr. Ball: There are two main types of reclaim dispersions, designated in terms of the degree of stability desired in use. A *stable* dispersion maintains the rubber-in-water structure for the maximum length of time, and is known as a "medium break" type. An *unstable* dispersion in use undergoes inversion of phase quickly, and is known as a "quick break" type. The "break", or change of phase, is caused by pressure, evaporation or absorption.

An alkali digester process natural rubber reclaim is preferred, either from whole tire, carcass or inner tube scrap. Contamination by synthetic rubber scrap is undesirable, as it results in the formation of tailings. The concentration of most dispersions is 50 to 60% solids by weight, and the method of application is by roll coat, brush, spray or trowel.

Reclaim dispersions are used as adhesives, coatings or binders in various industries, such as automotive, rug, furniture, paper and curled hair. Reclaimed rubber is readily dispersed, and its dispersions deposit films which have good aging properties at elevated temperatures.

Question—Is reclaim ever used in conjunction with nitrile rubber in compounding?

Answered by Mr. Hoover: The author of this question does not state whether he refers to an oil-resistant or a non-oil-resistant reclaim. Reclaims are currently being prepared from oil-resistant elastomers and have found application in extruded and molded items. Processing and economical advantages are contributed by this type reclaim. Unfortunately, the supply of suitable basic scrap is not too plentiful and as a consequence use is somewhat limited. Whole tire reclaim is compatible with the oil-resistant polymers, and is being used as a processing aid, and for cost reduction. The amount used is of course dependent upon ultimate requirements for oil and solvent resistance.

Question—Are there any limits to the amount of metal that is present in whole tire reclaims and mechanical reclaims?

Answered by Mr. Huddleston: Improved methods of removing metal, such as mechanical separation and permanent magnetic pick-ups, produce a whole tire reclaim which is essentially metal-free. Any traces of residual metal are usually non-magnetic.

and therefore soft. Mechanical reclaims present less of a problem, because their scraps do not contain as much metal.

Question—What is the market importance of reclaim in asphalt products?

Answered by Mr. Busenberg: The number of inquiries on this subject indicates tremendous interest at the present time. There are no trade statistics on tonnage of reclaim in this use.

Use of reclaimed rubber or ground scrap rubber as an additive to asphalt along with resins and other compounding ingredients is a sizeable market. Some work has been done with ground scrap and powdered reclaim in experimental road and playground surfaces. Joint sealing compounds, roofing and caulking compounds, interface adhesives for bonding new concrete repair patches or resurfacing to old concrete, sound deadening compounds, and protective coatings are typical uses.

Methods of manufacture, depending on smoothness and other properties desired, vary widely, from stirring together hot to complete dispersion in heavy-duty dough mixers. Reclaim dispersions or solvent adhesives can be worked into hot asphalt, asphalt emulsions or asphalt solvent cut-backs. Types of reclaim vary from ground scrap rubber, powdered or pelletized reclaim to reclaim in conventional slab form.

Question—Compare physical characteristics of butyl rubber reclaim with those of reclaims from other elastomers.

Answered by Mr. Ball: The most important grade of butyl rubber reclaim has a specific gravity of 1.15 to 1.16, which is lower than that of other important grades of reclaim. The tensile strength and ultimate elongation of about 1300 psi and over 500%, respectively, are higher than for most other important grades. Furthermore, this high tensile strength represents a much higher proportion of the tensile of the original compound than is the case with any other reclaim, the proportion of tensile retained being at least two-thirds of that of the original compound. The cured hardness is low—in the 40's. The air retention properties are about the same as those of new butyl rubber.

Butyl reclaim is compatible with new rubber, and the combination will cure satisfactorily. In this respect butyl reclaim has an advantage over butyl rubber. Good sunlight resistance is frequently possessed by such combinations, whereas with ordinary reclaims only one type of new rubber, viz., neoprene, is especially suitable for admixture where sunlight resistance is required. Butyl reclaim is the only reclaim which can be used with new butyl rubber.

In some processing properties, butyl reclaim is better than new butyl rubber. Mixing time is usually less, and the uncured stock is less tender, which is an advantage in certain articles like inner tubes. It is like butyl rubber in its capacity for high loadings of filler; therefore, smoothness of extrusion may be obtained by proper compounding.

Question—In the manufacture of reclaim, what would be the result of butyl rubber being mixed in small quantities with natural rubber scrap? Also, in the manufacture of butyl rubber reclaim, what would happen if some natural or GR-S became mixed in?

Answered by Mr. Huddleston: Small quantities of butyl rubber scrap, mixed with natural rubber scrap, would not be detectable in the resulting reclaim. The butyl would act as a plasticizer, and the effect would be almost negligible in both the uncured and cured state. The presence of moderate amounts of natural rubber or GR-S scrap mixed with butyl scrap would not greatly affect the properties of the uncured butyl reclaim, but the curing characteristics of the finished reclaim would be greatly affected, making the vulcanization progressively more difficult as the percentage of natural or GR-S scrap increased.

Question—What tests do reclaimers use to insure the purity of butyl rubber scrap and what percentage of other polymers is ordinarily present in the butyl reclaim as sold commercially?

Answered by Mr. Boyd: All reclaimers use every precautionary measure known to try to be certain there is no other polymer present in butyl reclaim. For example: (1) Tubes are inspected for blue lines; (2) Valves and valve patches are removed from tubes; (3) Cutting tests as well as burning tests are made, and (4) Dead weight tests are used. Physical property tests are also made; any other polymer contamination is readily shown by loss in physical properties. If contamination is excessive, spongy and blistered test slabs will result.

Question—What reclaims are made odor-free?

Answered by Mr. Glenn: There are, to my knowledge, no reclaims that are completely odor-free. However, where the end use requires, it is possible to get special reclaims in which the odor is minimized. A good example of this was the red tube reclaim which for years was used in considerable volume in the manufacture of jar rings.

Question—Comment on the value of compounded reclaims as compared with customer compounding of regular material.

Answered by Mr. Hoover: We assume that compounded reclaims as mentioned in this request refer to those with specific gravities greater than 1.25. Higher gravity reclaims have been extensively used to shorten factory mixing cycles, improve dispersion and increase tensile properties. Dispersion of ingredients is far superior when included prior to processing as a reclaim than for conventional mixing. The improvement in dispersion is the result of a semi-dry mixture of reclaim intermediates with the various additives, being subjected to a mill or Banbury assembly, followed by straining and finally refining. Refiners are operated at settings to produce sheets 3 to 10 mils in thickness with resulting sheets wrapped on a drum. Frequently, this reclaim is used with only curatives added on the customer's mill or in an internal type mixer such as a Banbury. Reclaims of this nature are produced in volume quantities only, and are used in highly competitive mechanical items. Volume costs of this material run somewhat higher than a corresponding straight mix; however, the savings in reduced mixing cycles, better processing and higher physicals more than justify the additional expense.

Question—Is there available a truly non-staining reclaim, and if so, what is its nature?

Answered by Mr. Ball: There is no such thing as a completely non-staining reclaim, at least at present. Indeed, I believe it may truthfully be said that there is no such thing as a completely non-staining rubber of any kind. There is in use, however, a large tonnage of commercially satisfactory non-staining reclaim, selling at a moderate premium. The manufacture of this type depends upon the use of selected scrap, the use of non-staining reclaiming agents, and also upon the use of active carbons for absorbing any inherently objectionable ingredient. Such a product tends to be drier in processing, somewhat lower in tensile properties, and somewhat higher in cured hardness than conventional whole tire reclaims.

Question—How effective is activated carbon in reducing staining of reclaims?

Answered by Mr. Huddleston: When reclaims are made from specially selected scraps, activated carbon is effective in absorbing traces of staining materials, but with ordinary scraps it is only effective to the same degree and, therefore, is not sufficient to absorb the entire amount of staining material. Since activated carbon is a surface active agent, good dispersion, such as can be attained by incorporation during reclaiming, enhances its effect. In general, the addition of activated carbon renders non-staining reclaims good enough to pass the staining standards of the tire and mechanical goods industries.

Question—What effect have carbons in reducing staining from reclaim in other than tire application, such as black matting with an inlay of white rubber?

Answered by Mr. Glenn: The use of non-staining reclaim is the most effective method for preventing stain from reclaim in an application such as black matting with an inlay of white rubber. Activated carbons are effective in absorbing certain staining ingredients but will not take care of cases of severe staining. The use of activated carbon through compounding to reduce staining has the further limitation of adversely affecting physical properties. As a direct result, very limited quantities of activated carbons are directly compounded in stocks of this type.

Question—What, in your opinion, does the future hold for reclaimed rubber? In other words, what effect will recent developments in the rubber industry, such as the expansion of GR-S production, the increasing use of tubeless tires, the possibility of butyl rubber treads, etc., have on the production and cost of reclaim, as well as the demand for it?

Answered by Mr. Ball: In my opinion the future for reclaimed rubber is good. The expansion of production of GR-S types is caused partly by increased demand for rubber of all kinds, including reclaimed rubber. It is also caused partly by cost considerations in a high price market for natural rubber. But truck tires are the biggest consumers of natural rubber, and there reclaim is not as important a factor in the over-all picture. In passenger tires, which use the most reclaim, the sidewall and undertread may actually permit a higher proportion of reclaim with GR-S than with natural rubber. In the carcass the reverse is true in some cases, but on the other hand many tire companies keep the proportion of reclaim constant in the carcass, varying only the GR-S and natural rubber according to relative costs. So far as whitewall tires are concerned, the non-staining reclaim now being used is completely satisfactory at a moderate premium in price.

With regard to the forthcoming 14-inch rim tire, this will be another step toward a larger cross section which in the past has always meant more rubber per tire. It is not yet completely clear whether or not the new 14-inch rim tire will actually use more rubber per tire, but it does seem to be clear that the rubber per tire will be approximately the same, either slightly more or slightly less. Therefore, assuming a constant ratio of reclaim, this would result in approximately the same amount of reclaim per tire as with the present 15-inch rim.

Tubeless tires may contain an inner liner for improvement in air retention in addition to that offered by the carcass. The inner liner may contain reclaim, either butyl or whole tire, which therefore represents a slight gain per tire for reclaim. If butyl rubber tires are made they will presumably contain butyl reclaim, and therefore should not upset the total tire demand for reclaim.

On balance, therefore, we see nothing in the tire picture at this time which will greatly change the reclaim situation in the near future. For the long term the use of reclaim will share in the increased demand for rubber of all kinds due to the population growth and the increase in super highways.

The most important objective for the reclaimers, in my opinion, is lower manufacturing costs to offset constantly increasing labor and freight costs. The permanent competitor of reclaim is synthetic rubber, where the proportion of labor cost is much less than for reclaim. Finally, the reclaimer must continually develop new products to meet real demands.

Increasing Service Life of Skiving Knives

HIGH-alloy steel blades on a disc-like skiving knife were found to wear excessively when used to slice strips of rubber into designated widths. In fact, the knives had to be removed from the machine and resharpened after every shift, causing high down-time costs. By flame-plating these knives with a thin coating of tungsten carbide, their service life was increased 15 times, which reduced down-time to a minimum.

The knives have a bevel on one side of the blade only. Tungsten carbide is flame-plated on the flat, unbeveled side and is used in the as-coated (125 microinches rms) condition or brush finished to 50 microinches rms. A self-sharpening effect is another advantage achieved by flame-plating these knives. As the softer, steel base wears more rapidly than the hard, tungsten carbide coating, a sharp edge is always presented to the material being cut.

Flame-plating is a service developed by the Linde Air Products Company, a Division of Union Carbide and Carbon Corporation, to provide manufacturers with an effective method of combatting wear. As the temperature of the part does not exceed 400°F. during the coating operation, finished precision parts can be flame-plated with assurance of complete dimensional and metallurgical stability. For close tolerance parts and tools, the tungsten carbide coating may be ground and lapped to a 0.5 microinches rms smoothness.

Proposed Tentative Specifications and Methods of Test for Flexible Urethane Foam

Within the past few years, the introduction of flexible urethane foams has created a great deal of interest. Understandably, there has been a singular lack of technical information concerning these materials, and an even greater lack where specifications and test methods are concerned. Because of the wide interest in this subject, we have undertaken the publication of these tentative specifications and test methods as they were prepared by the Flexible Urethane Foam Test Methods Subcommittee, Cellular Plastics Division, Society of the Plastics Industry, Inc. It should be borne in mind, however, that these are only preliminary and tentative. We would be interested in having comments from our readers on these proposed specifications and test methods.

Prepared by the Flexible Urethane Foam Test Methods Subcommittee of the SPI Cellular Plastics Division

Proposed Tentative Specifications and Methods of Test for Flexible Urethane Foam

Prepared by the Flexible Urethane Foam Test Methods Subcommittee of the SPI Cellular Plastics Division

INTRODUCTION

1—Scope: (a) These test methods apply to flexible cellular foams known as urethane foams. Urethane foams may be generally defined as an expanded cellular product produced by the interaction of a polyhydroxy compound, water, and an isocyanate.

(b) In case of conflict between the provisions of these general specifications and those of detailed specifications or methods of test for a particular product, the latter shall take precedence. Reference to methods for testing urethane foams should specifically state the particular test or tests desired.

2—Manufacture: The structure of flexible urethane foam consists of a network of cells of uniform character which are essentially open and interconnecting. It is manufactured in sheet, strip, molded or specific shapes. It may be either cored or solid. Size, shape, and distribution of the coring shall be at the manufacturer's option, but subject to the approval of the purchaser.

3—Grades of Urethane Foam: Urethane foams shall have their grade numbers designated by digits, the first of which identifies the kind of urethane foam as follows:

2—Urethane foams, cored
3—Urethane foams, uncored

Suffix letters may be added singly or in combination after any grade number to indicate additional requirements beyond those specified in Table I as basic requirements. The significance of the approved suffix letters is as follows:

SUFFIX LETTERS

B_1* Constant load compression set test required.
D_1* Compression load deflection test required.
G* Tear resistance test required.
H Constant deflection flexing test required with values as specified in Table I.
M* Flammability test required.
T* Tensile test required.
W* Density determination required.

NOTE: Reference to these methods for testing urethane foam should specifically state the particular test or tests desired and not refer to these methods of testing as a whole.

* Test values to be determined between the manufacturer and the purchaser.

4—Material and Workmanship: (a) All materials and workmanship shall be in accordance with good commercial practice and the resulting cellular urethane foam shall be free from defects affecting serviceability.

(b) Due to manufacturing conditions, material may have to be altered or repaired. This repaired or altered material will be acceptable under these specifications provided the material used in such repairs or alterations shall be the same composition and quality as the original product and provided such alterations do not affect the serviceability, size, and shape beyond tolerances as provided herein.

5—Color: Unless otherwise specified, the color of urethane foams shall be optional with the manufacturer.

6—Physical Properties: The various grades of urethane foam shall conform to the basic requirements together with any additional requirements indicated by the suffix letters.

7—Methods of Testing: Unless specifically stated otherwise, all tests shall be made in accordance with the methods specified in sections 13 through 62 which include test procedures for the following:

BASIC TESTS	
Humidity Aging	Sections 13-16
Constant Deflection Compression Set	Sections 17-21
Indentation Load Deflection	Sections 27-31
SUFFIX TESTS	
Constant Load Compression Set	Sections 22-26
Compression Load Deflection	Sections 32-36
Constant Deflection Flexing	Sections 37-41
Density Determination	Sections 42-45
Tear Resistance	Sections 46-51
Flammability	Sections 52-56
Tensile	Sections 57-62

8—Test Conditions: Urethane foams are affected by temperature and humidity and therefore tests shall be conducted under known conditions. In cases of dispute, the tests shall be made at a temperature of 73.4±2°F. and in an atmosphere having a relative humidity of 50±2%. The product shall be conditioned undeflected and undistorted at this temperature and humidity for at least 12 hours before being tested. Ordinarily only one specimen shall be tested, but in cases of dispute, the result shall be expressed as the average of the tests on a minimum of three specimens.

9—Tolerances on Dimensions: Tolerances on dimensions of urethane foam products are given in Table II. These tolerances are published as information for guidance only and shall not be considered as a part of these specifications.

TABLE I —PHYSICAL REQUIREMENTS FOR URETHANE FOAMS

Grade No.	Basic Requirements: Indentation Load Deflection Designation	Indentation of 50 sq. in. 25% Deflection (Limits), Lb.	Humidity 158°F. Aging 95–100% r. h. 7 days: Comp. Load Defl. Loss Max. %	Humidity 158°F. Aging 95–100% r. h. 7 days: Const. Defl. Comp. Set Max. %	Requirements Added by Suffix Letters: Const. Defl. Compr. Set 22 hr. at 158°F. 50% Defl. Max. %	Suffix H Const. Deflection Flexing 250,000 Flexes 50% Deflection: Ht. Loss Max. %	Suffix H Const. Deflection Flexing 250,000 Flexes 50% Deflection: Load Defl. Loss Max. %
			Urethane Foam (Cored)				
U2							
U2							
U2							
U2							
U2							
U2							
			Urethane Foam (Uncored)				
U3							
U3							
U3							
U3							
U3							

10—Inspection and Rejection: (a) All tests and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified. The manufacturer shall afford the inspector all reasonable facilities, without charge, for tests and inspection.

(b) The purchaser may make the tests and inspection to govern acceptance or rejection of the material at his own laboratory or elsewhere. Such tests and inspection shall be made at the expense of the purchaser and not later than 15 days after receipt of the material.

(c) All samples for testing, provided as specified in section 2, shall be visually inspected to determine compliance with the material and workmanship requirements.

(d) Any material which fails in one or more of the test requirements may be retested at the expense of the manufacturer. For this purpose, two additional tests shall be made for the requirement in which failure occurred. Failure of either of the re-tests shall be cause for final rejection.

(e) Rejected material shall be disposed of as directed by the manufacturer and at his expense.

11—Sampling: (a) When possible, the completed manufactured product shall be used for the tests specified. Representative samples of the lot being examined shall be selected at random as required.

(b) When it is necessary or advisable to obtain test specimens from the article, as in those cases where the entire sample is not required or adaptable for testing, the method of cutting and the exact position from which specimens are to be taken shall be specified. The density and the state of cure may vary in different parts of the finished product, more especially if the article is of complicated shape or of varying thickness and these factors affect the physical properties of the specimens. Also, the density is affected by the number of cut surfaces as opposed to the number of skin-covered surfaces on the test specimen.

(c) When the finished product does not lend itself to testing or to the taking of test specimens because of complicated shape, small size, metal or fabric inserts, adhesion to metal, or other reasons, test slabs as agreed upon by the manufacturer and customer shall be prepared.

(d) When differences due to the difficulty in obtaining suitable test specimens from the finished part arise, manufacturer and purchaser may agree on acceptable deviations. This can be done by comparing results of standard test specimens and those obtained on actual parts.

12—Measurements of Test Specimens: (a) The length and width shall be measured with a steel scale or tape. Care shall be taken not to distort the urethane foam.

(b) Thicknesses up to and including 1 inch shall be measured using a dial-type gage with a minimum foot area of 1 square inch. Pressure of the dial foot shall be held to 0.025 ± 0.005 psi. Thicknesses over 1 inch may be measured with a dial gage, a sliding caliper gage or as specified in paragraph (a). When a sliding caliper gage is employed, the gage setting shall be made with the gage out of contact with the urethane foam. The sample shall be passed through the previously set gage and the proper setting shall be the one when the measuring faces of the gage contact the surfaces of the article without compressing it.

(c) The scale, tape or gage shall be graduated so as to permit measurements within $\pm 1\%$ of the dimensions to be measured.

(d) Results reported shall be the average of a minimum of three measurements.

HUMIDITY AGING TESTS

13—Scope: This test consists of aging the urethane foam specimen under humid conditions and noting the effect on physical properties of the specimen.

14—Specimens: The specimens to be used in this test shall be of such size as to conform to the specimen size required in the test procedures for the properties to be evaluated by this test.

15—Procedure: (a) The specimen shall be tested, both before and after aging, for compression load deflection as indicated in sections 32 to 36 and shall be tested for compression set, after aging, as prescribed in sections 17 to 21.

(b) The test specimen shall be placed in a humid chamber such that all surfaces are exposed to the atmosphere. The chamber is to be maintained at 158°F.±2°F. and 95 to 100% relative humidity. The specimen shall be aged for a period of 7 days.

(c) The test specimen shall be removed from the chamber and dried for 30 minutes at 158±2°F. and then allowed to return to room temperature before evaluating its physical properties.

16—Calculations: (a) The percentage compression load deflection loss shall be calculated as follows:

Compression Load Deflection Loss =

$$\frac{Lo - L_4}{Lo} \times 100$$

where Lo = original compression load deflection value, and

L_4 = compression load deflection after aging.

(b) The compression set shall be calculated as indicated in sections 17 to 21 and shall be known as Humidity Aging Compression Set.

COMPRESSION SET TEST

METHOD A—CONSTANT DEFLECTION

17—Scope: This test consists of deflecting the urethane foam specimen under conditions of time and temperature and noting the effect on the height of the specimen.

18—Apparatus: The compression device shall consist of two flat plates with spacers and clamps such that the plates are held parallel to each other and the space between the plates is adjustable to the required deflection height.

19—Specimens: (a) The specimens for this test shall have parallel top and bottom surfaces and essentially vertical sides.

(b) Specimens from slab stock shall be at least 1 square inch in area and a minimum of ½-inch thickness. Specimens less than ½-inch thickness shall be plied up, without the use of cement, to a minimum of ½-inch thickness.

(c) Cored stock specimens shall be of such size that the coring does not appreciably affect the test result.

(d) The minimum dimensions of the horizontal surface must be greater than the height of the specimen.

20—Procedure: (a) The test specimen shall be gaged according to the procedure in section 12.

(b) The specimen shall be placed in the apparatus and deflected 50% of its height.

(c) The deflected specimen and apparatus shall within 30 minutes be placed in a 158±2°F. mechanically convected air oven for a period of 22 hours.

(d) The specimen shall be removed from the apparatus and gaged according to procedure in section 12 after a 30 minute rest at 73.4±2°F.

21—Calculations: The percentage Compression Set shall be calculated as follows:

Constant Deflection Compression Set, percent of original height =

$$\frac{To - T_1}{To} \times 100$$

where To = original thickness and T_1 = thickness of specimen 30 minutes after removal from the apparatus.

NOTE: If it is desired to calculate the compression set as a percentage of the deflection rather than as a percentage of the original height, the above result may be multiplied by two.

METHOD B—CONSTANT LOAD—SUFFIX B_1

22—Scope: This test consists of applying a constant load to the urethane foam specimen under conditions of time and temperature and noting the effect on the height of the specimen.

23—Apparatus: The apparatus shall be a portable device consisting of two parallel compression plates assembled by means of a frame or posts in such a manner that a dead load can be applied and the parallelism of the plates be maintained.

24—Specimens: (a) The specimens for this test shall have parallel top and bottom surfaces and essentially vertical sides.

TABLE II—TOLERANCES ON DIMENSIONS OF URETHANE FOAM PRODUCTS

	Thickness (In.)			Length and Width (In.)		
	Dimensions	Tolerance, Plus	Tolerance, Minus	Dimension	Tolerance, Plus	Tolerance, Minus
Cored	0 to 3, incl.	1/8	1/32	0 to 6, incl.	1/16	1/16
	3 to 5, incl.	3/16	1/8	6 to 12, incl.	3/32	1/8
	5 and over	1/4	1/32	12 to 24 incl.	1/8	1/4
				24 to 36, incl.	5/32	3/16
				36 to 48, incl.	3/16	1/2
				48 to 60, incl.	7/32	5/16
				60 to 72, incl.	1/4	3/4
				72 and over	1 1/8	7/8
	From / To					
Uncored	0 / 1/4	1/32	1/32	0 to 6, incl.	1/16	1/16
	1/4 / 1/2	1/32	1/16	6 to 12, incl.	1/8	1/8
	1/2 / 1	1/16	1/16	12 to 24, incl.	11	1/4
	1 & up	1/8	1/8	24 to 36, incl.	3/16	3/8
				36 to 48, incl.	1 1/16	1/2
				48 to 60, incl.	1 1/4	5/8
				60 to 72, incl.	1 3/8	3/4
				72 and over	1 1/2	7/8

(b) Specimens from slab stock shall be at least 1 square inch in area and a minimum of ½-inch thickness. Specimens less than ½-inch thickness shall be plied up, without the use of cement, to a minimum of ½-inch thickness.

(c) Cored stock specimens shall be of such size that the coring does not appreciably affect the test result.

(d) The minimum dimensions of the horizontal surface must be greater than the height of the specimen.

25—Procedure: (a) The test specimen shall be gaged according to the procedure in section 12.

(b) The specimen shall be tested for compression load deflection according to procedure in sections 32 to 36 except the deflection shall be 50%.

(c) The specimen shall be placed in the apparatus and a load, equal to that found in the compression load deflection test, applied to the specimen.

(d) The deflected specimen and apparatus shall within 30 minutes be placed in a 158±2°F. oven for a period of 22 hours.

(e) The specimen shall be removed from the apparatus and gaged according to the procedure in section 12 after a 30 minute rest at 73.4±2°F.

26—Calculations: The percentage Compression Set shall be calculated as follows:

Constant Load Compression Set, percent of original height =

$$\frac{T_o - T_i}{T_o} \times 100$$

where T_o = original thickness, and
T_i = thickness of specimen 30 minutes after removal from the apparatus.

NOTE: If it is desired to calculate the compression set as a percentage of the original deflection, rather than as a percentage of the original height, the above result may be multiplied by two.

LOAD DEFLECTION TESTS

METHOD A—INDENTATION

27—Scope: This test consists of measuring the load necessary to produce a 25% indentation in the urethane foam product.

28—Apparatus: An apparatus having a flat circular indentor foot 50 square inches in area, connected by means of a swivel joint to a load measuring device and mounted in such a manner that the product or specimen can be deflected at a suitable rate, shall be used for this test. The apparatus shall be arranged to support the specimen on a level horizontal plate which is perforated with 0.25-inch holes on 0.75-inch centers to allow for rapid escape of air during the test.

29—Test Specimens: The test specimens shall consist of the entire product sample or a suitable portion of it, except that in no case shall the specimen have dimensions less than 15 inches x 15 inches x ¾-inch. Specimens less than ¾-inch thickness shall be plied up, without the use of cement, to a minimum of ¾-inch.

30—Procedure: (a) The specimen shall first be twice deflected 70%±5% of its original height using either rollers or plates as a means of obtaining the deflection. The specimen shall then be allowed to rest a period of 10±5 minutes.

(b) The test specimen shall then be placed in position on the supporting plate of the apparatus. In case the product has one side cored or honeycombed, this face shall rest on the perforated plate. The specimen position shall be such that whenever practicable the indentation will be made at the center of all articles.

(c) The indentor foot shall be brought into contact with the specimen and the height shall be determined after applying a total preload of 1 pound. The product shall then be compressed 25% of this height and the final load in pounds observed after 1 minute.

31—Calculations and Results: The results shall be expressed in pounds and shall be known as the load required for 25% indentation of a 50 square inch area of specimen.

METHOD B—COMPRESSION—SUFFIX D_1

32—Scope: This test consists of measuring the load necessary to produce a 25% compression over the entire top area of the urethane foam specimen.

33—Apparatus: An apparatus having a flat compression foot, larger than the specimen to be tested, connected to a load measuring device and mounted in a manner such that the product or specimen can be deflected at a suitable rate, shall be used for this test. The apparatus shall be arranged to support the specimen on a level horizontal plate which is perforated with 0.25-inch holes on 0.75-inch centers to allow for rapid escape of air during test.

34—Test Specimens: (a) The specimens for this test shall have parallel top and bottom surfaces and essentially vertical sides.

(b) Specimens from slab stock shall be a minimum of 2 square inches in area and a minimum thickness of ¾-inch. Specimens less than ¾-inch thickness shall be plied up, without the use of cement, to a minimum of ¾-inch thickness.

(c) Cored stock specimens shall be of such size that the coring does not appreciably affect the compression value.

35—Procedure: (a) The specimen shall first be twice compressed 75% of its original height using either rollers or plates as a means of obtaining the compression. The specimen shall then be allowed to rest a period of 10±5 minutes.

(b) The test specimen shall be placed in position on the supporting plate of the apparatus. In case the product has one side cored or honeycombed, this face shall rest on the perforated plates.

(c) The compression foot shall be brought into contact with the specimen and the height shall be determined after applying a total preload of 0.02 pound per square inch of specimen area. The product shall then be compressed 25% of this height and the final load observed after 1 minute.

36—Calculations and Results: The result shall be expressed in pounds per square inch of specimen area, and shall be known as the load required for 25% compression of 1 square inch specimen area.

FLEXING TESTS

(Low Frequency)

METHOD A—CONSTANT DEFLECTION—SUFFIX H

37—Scope: This test consists of subjecting the urethane foam specimen to repeated deflections and noting the effect on specimen height, load deflection and cellular structure.

38—Apparatus: The test apparatus shall consist of a machine having parallel plates one of which moves with respect to the other to produce uniform deflection of the specimen. The bottom plate shall be perforated with 0.25-inch diameter holes located on 0.75-inch centers. The flexing plates of the machine shall be at least 0.25-inch larger on each side than the specimen being tested. The machine shall operate at 60 cycles per minute.

39—Test Specimens: The specimens to be used in this test shall be of such size as to conform to the specimen size required in the test procedures for the properties to be evaluated by this test.

40—Procedure: (a) The specimen shall be measured for height as indicated in section 12 and for load deflection, either indentation or compression, as indicated in either sections 27 to 31 or 32 to 36.

(b) The plate positions shall be adjusted so that the amplitude of the flexing with respect to the test specimen will be 50% of the original thickness. The specimen shall be placed on the machine and subjected to 250,000 cycles of flexing.

(c) Thirty minutes after flexing the specimen shall be measured for height as indicated in section 12 and for load deflection, either indentation or compression, as indicated in sections 27 to 31 or 32 to 36, except that the pre-compressing of the specimen is to be omitted and the original specimen height is to be used in determining the deflection.

41—Calculations and Observations: (a) The specimen shall be checked for physical breakdown of the cellular structure by visual examination and comparison with unflexed specimens.

(b) The percentage height loss shall be calculated as follows:

Constant Deflection Flexing height loss =

$$\frac{To - T_1}{To} \times 100$$

where To = original thickness, and
T_1 = thickness 30 minutes after flexing.

(c) The percentage load deflection loss shall be calculated as follows:

Load Deflection Flexing Loss =

$$\frac{Lo - L_1}{Lo} \times 100$$

where Lo = original load deflection value, and
L_1 = load deflection 30 minutes after flexing.

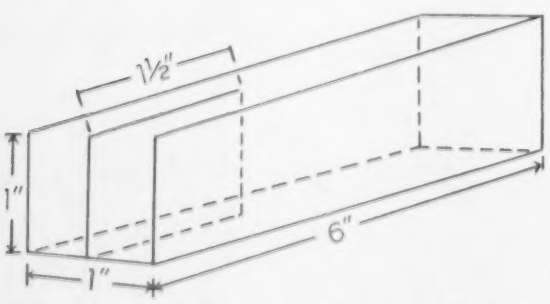


FIG. 1—Test specimens shall be of a block shape as shown above.

DENSITY DETERMINATION

Suffix W

42—Scope: This method describes the procedure for determining the density of uncored urethane foam by calculation from the weight and volume of a regular shaped specimen.

43—Test Specimens: (a) Representative specimens of regular shape, not less than one cubic inch in volume, shall be cut from the sample to be tested.

(b) The specimens shall be free from surface skin. If the entire sample to be tested meets the above requirements, it may be used in its entirety for the density determination.

44—Procedure: (a) Weigh the specimen on a balance or scale graduated so as to permit weighings within ±1% of the weight to be measured.

(b) Determine the dimensions of the specimen as indicated in section 12.

45—Calculations: The density shall be reported in lbs./cu.ft. and shall be calculated as follows:

Density in lbs./cu. ft. =

$$\frac{\text{Weight of specimen in lbs.}}{\text{Volume of specimen in cu. ft.}} \times 62.4$$

If measurements are more conveniently made in the metric system, the density shall be calculated and converted to the English units as follows:

Density in lbs./cu. ft. =

$$\frac{\text{Weight of specimen in grams}}{\text{Volume of specimen in cc's}}$$

TEAR RESISTANCE TEST

Suffix G

46—Scope: This method describes the procedure for determining the tear resistance of flexible urethane foam. The block method, as described, produces a value which may be regarded as a measure of the tear resistance under the conditions of this particular test. This is useful in a comparative sense and does not necessarily indicate service performance.

47—Apparatus: Tear resistance shall be measured on a power-driven apparatus which will indicate the final load at which rupture takes place. An automatic machine may be used which draws the actual curve; or else, a style of scale shall be used with an indicator which remains at the point of maximum load after rupture. The rate of travel of the power-actuated grip shall be 2 inches per minute and uniform at all times.

48—Test Specimens: Test specimens shall be of a block shape as shown in Figure 1. These may be cut on a saw or died out from sheet material so that the sides are parallel and perpendicular to each other. A 1½-inch cut is placed in one side as shown in the figure.

49—Number of Test Specimens: Three specimens per sample shall be tested for tear resistance. The values reported shall be the mean of those observed. If any value deviates more than 20% from this mean, two additional specimens shall be tested and the mean for all five values shall be reported.

50—Procedure: The specimen for test shall be clamped in the jaws of the testing machine with care being taken that the jaws grip the specimen properly. The block shall be so spread that each tab is

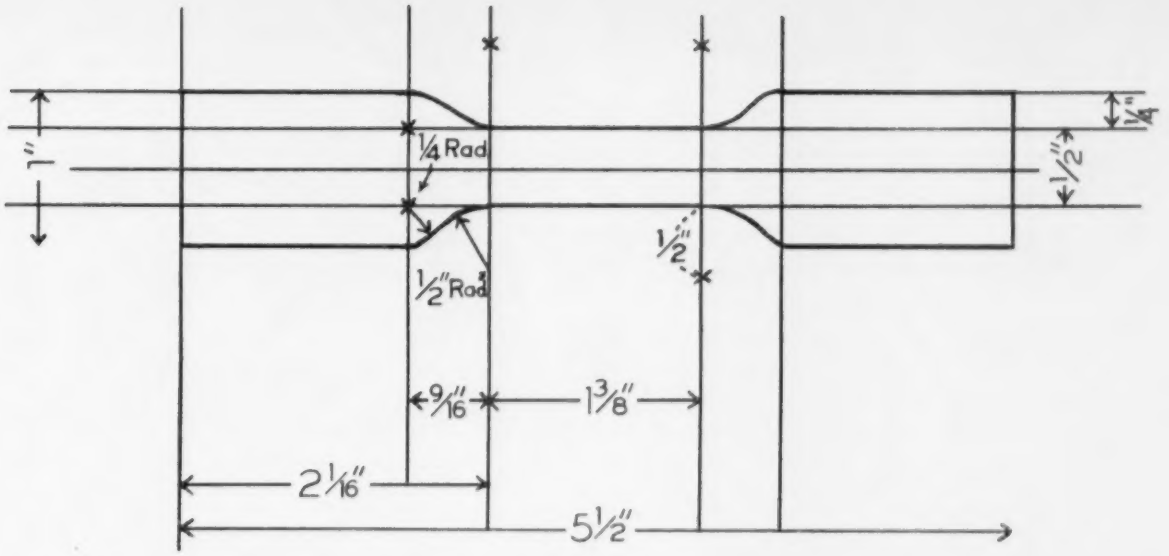


FIG. 2—The tensile test unit shall have a type of grip which tightens automatically and exerts a uniform pressure across the gripping surfaces.

held in the jaw to pull across the specimen. The load shall then be applied with a jaw speed of 2 inches per minute. The cut in the block sample shall be aided with a razor blade or knife, so as to keep it in the center of the block. After rupture of the specimen, or after, at least, a 2-inch length is torn, the breaking load in pounds shall be noted as the maximum on the dial or scale and recorded together with the thickness of the specimen.

51—Calculations: The resistance to tear shall be calculated from the maximum load registered on the testing machine and the average thickness of the specimen and shall be expressed as the pull in pounds required to tear a specimen 1 inch in thickness.

FLAMMABILITY

Suffix M

52—Scope: This test consists of igniting the urethane foam specimen and measuring the burning rate, burning time, and rate of flame propagation.

53—Apparatus: A 2-inch x 12-inch piece of ¼-inch mesh hardware cloth, folded lengthwise to form a trough whose sides are at 90° angles, shall be used for this test. The trough shall be mounted apex down at an angle of 30° with the horizontal with facilities for adjusting its height above the working surface. A standard Bunsen Burner using 1,000 BTU gas fuel shall be mounted such that the burner tube forms an angle of 30° with the vertical and 90° with the trough. The apparatus shall be used in a draft free enclosure.

54—Specimens: The test specimens shall be ½-inch x ½-inch x 6 inches and free from unusual voids or irregularities. Unless testing of skin surface is required, all surfaces shall be free from skin.

55—Procedure: (a) The specimen shall be placed in the lower end of the trough in such a manner that ½ inch extends beyond the lower end.

(b) The tip of a 2-inch blue flame from the burner shall be brought to the point where it just contacts the specimen.

(c) After 10 seconds the burner shall be removed and the time to complete burning or extinguishing time and flame propagation shall then be measured.

56—Calculations and Observations: (a) Report the estimated amount of sample consumed to the closest 10% on a volume basis.

(b) Report the burning time as the period from the end of ignition to the time all live flame extinguishes.

(c) Report the flame propagation as the time in minutes required for any part of the flame to traverse the entire length of the sample. This time shall be counted from the end of the ignition period. Do not report flame propagation time if the flame does not reach the end of the sample.

(d) Compute the burning rate by dividing the substantially consumed length in inches by the burning time in minutes. Report burning rate if the consumed length is greater than 1 inch.

Compute the flame propagation rate by dividing the length of the sample in inches by the flame propagation time in minutes.

(e) Samples which do not burn a distance of at least one inch after the ignition period shall be reported as self extinguishing and burning time only will be reported.

TENSILE TESTS

Suffix T

57—Scope: This method of test outlines the procedure for determining the effect of the application of a tensile load to flexible urethane foam materials. Measurements are made for tensile stress, tensile strength, and ultimate elongation.

58—Apparatus: (a) Dies—The specimen for tensile tests shall be stamped out with a die of the shape and specification shown in Figure 2. The die shall be sharp and free of nicks in order to prevent leaving ragged edges on the specimen.

(b) Bench Marker—The bench marker shall have two parallel marking edges 1/16-inch in thickness; and spaced 1 inch apart on centers.

(c) Thickness Gage—The dimensions of the test section shall be determined with a suitable thickness gage as outlined in section 12.

(d) Testing Machine—Tensile tests shall be made on a power-driven machine complying with the following requirements:

The machine shall be of such capacity as to allow the test specimen to break at practically ¾ of its total value or maximum sensitivity. It shall be equipped with a dial or scale indicator that will remain at the point of maximum load after rupture of the test specimen and will measure the applied tension at that point. Rate of travel of a power-actuated grip shall be 20 inches ±1 inch per minute and shall be uniform at all times.

The machine may be equipped with a device graduated to 0.01-inch for measuring the elongation. For testing dumbbell specimens, the machine shall have either screw type flat plate grips or a type of grip which tightens automatically and exerts a uniform pressure across the gripping surfaces increasingly as the tension increases to prevent slipping. (See Figure 2.)

59—Test Specimens: The test specimens shall be cut from flat sheet material 0.500 ± 0.0625-inch thick. The top and bottom surfaces shall be parallel and free of skin. The cut edges shall be perpendicular to the top surface and be free of ragged edges. The specimens shall be died out either parallel to or across the direction of rise of the foam and shall be so specified.

60—Number of Test Specimens: Three specimens per sample shall be tested for tensile properties. The values reported shall be the mean of those observed. If any value deviates more than 20% from this mean, two additional specimens shall be tested and the mean for all five values shall be reported.

61—Procedure: The dumbbell specimens shall be placed in the grips of the testing machine, using care to adjust them symmetrically, in order that the tension will be distributed uniformly over the cross-section. The machine shall be started and the distance between the two bench marks shall be noted continuously, if that is the method in determining the elongation. The stress at the corresponding elongation shall be recorded or if an automatic recording device is used, it will record the data continuously. At rupture, the elongation shall be measured or recorded to the nearest 0.1-inch.

62—Calculation: (a) Tensile strength shall be calculated by dividing the breaking load in pounds by the original cross-sectional area of the test specimen in square inches and shall be expressed as pounds per square inch.

(b) Tensile stress shall be calculated by dividing the load in pounds at a pre-determined elongation, by the original cross-sectional area of the test specimen, and shall be expressed as pounds per square inch at the given elongation.

(c) Ultimate elongation shall be calculated by subtracting the original distance between the bench marks in inches from the total distance between the bench marks at the time of rupture and expressing this difference as a percentage of the original distance as follows:

Ultimate elongation, % =

$$\frac{d - g}{g} \times 100$$

where d = the distance between bench marks at the break point, and
g = the original distance in inches.

Division of Rubber Chemistry, A. C. S., Meets in Atlantic City on September 19-21, 1956

THE 70th meeting of the Division of Rubber Chemistry of the American Chemical Society will be held at the Chalfonte-Haddon Hall Hotel in Atlantic City, N. J., on September 19 to 21, 1956. The meeting will feature the presentation of 26 technical papers, the Charles Goodyear Lecture, a luncheon-meeting of the 25-Year Club, the Annual Suppliers' Cooperative Cocktail Party, and the divisional banquet. The Rubber Division is meeting in conjunction with the parent society.

The technical program for the Rubber Division meeting has been divided into four sessions, each with a general theme. The session on Wednesday afternoon, September 19, will be devoted to "New Polymers" and the session on Thursday morning, September 20, to "Oxidation and Aging". The session on Thursday afternoon will be on "Carbon Black and Processing", while the final session on Friday morning, September 21, will be devoted to "Compounding and Testing".

Following the practice of the last few Rubber Division meetings, each session will be presided over by a different chairman. A. E. Juve (Goodrich), current chairman of the Rubber Division, will preside at the session on Wednesday afternoon. B. S. Garvey, Jr. (Sharples Chemicals), chairman-elect, will preside at the session on Thursday morning and D. C. Maddy (Harwick Standard) will preside at the session on Thursday afternoon. The final session on Friday morning will be presided over by A. J. Northam (DuPont).

The Charles Goodyear Lecture will be presented by Dr. S. M. Cadwell, vice-president in charge of research and development for the U. S. Rubber Co., during the morning session on September 20. Dr. Cadwell has chosen as his topic, "Scientific Contributions to the Rubber Industry". Presentation of the Charles Goodyear Medal will be made by Chairman Juve during the divisional banquet, which will be held at the Chalfonte-Haddon Hall Hotel on the evening of September 20. John P. Coe, retired vice-president of the U. S. Rubber Co., will speak on "Cadwell the Man".

Activities at the Rubber Division meeting will get under way with the luncheon-meeting of the 25-Year Club under the direction of E. R. Bridgwater (DuPont). The Annual Suppliers' Cocktail Party will be held on Thursday evening, September 20, preceding the divisional banquet. A program of entertainment has been arranged to follow the banquet.

A. J. Northam (DuPont) is serving as chairman of the Local Arrangements Committee for the meeting with T. K. Cox (Western Electric) as vice-chairman and treasurer. T. W. Gorman (Quaker Rubber) is in charge of the banquet and entertainment. He will be assisted by T. W. Elkin (R. T. Vanderbilt), J. B. Johnson (Linear) and D. B. Forman (DuPont).

On Tuesday afternoon, September 18, and Wednesday morning, September 19, a Symposium on the Literature of Rubber will be held. This symposium is being co-sponsored by the Rubber Division and the Division of Chemical Literature and will feature the presentation of 15 papers. The symposium has been divided into two sessions, one on Tuesday afternoon and the second on Wednesday morning preceding the regular Rubber Division meeting. Miss Hanna Friedenstein (Godfrey L. Cabot) will preside at both sessions.

Program of the
DIVISION OF RUBBER CHEMISTRY
AMERICAN CHEMICAL SOCIETY
Chalfonte-Haddon Hall Hotel, Atlantic City, N. J.
September 19-21, 1956

Wednesday Morning—September 19
9:00 A.M.—Registration.
11:30 A.M.—25-Year Club Luncheon.

Wednesday Afternoon—September 19
2:00 P.M.—Introductory Remarks by A. E. Juve (Goodrich), Division Chairman.
2:05 P.M.—Technical Papers.

Thursday Morning—September 20
9:00 A.M.—Technical Papers.
11:00 A.M.—Business Meeting.
11:15 A.M.—Charles Goodyear Lecture by Dr. S. M. Cadwell (U. S. Rubber).

Thursday Afternoon—September 20
2:00 P.M.—Technical Papers.

Thursday Evening—September 20
5:00 P.M.—Suppliers' Cooperative Cocktail Party.
7:00 P.M.—Divisional Banquet.

Friday Morning—September 21
9:00 A.M.—Technical Papers.

Chalfonte-Haddon Hall Hotel, site of the Rubber Division meeting.

Wednesday Afternoon—September 19

New Polymers

A. E. Juve, Presiding

2:00 P.M.—1—*Introductory remarks.*

2:05 P.M.—2—Cross-link Density in Ungelled Polybutadiene. *L. H. Howland, A. Nisonoff, L. E. Dannals and V. S. Chambers (Naugatuck Chemical Division, U. S. Rubber Co., Naugatuck, Conn.). (Paper will be presented by Mr. Howland).*

A thorough knowledge of the structure of polymers such as polybutadiene made by emulsion polymerization should aid in devising methods of improving the product made in such a system. Considerable work has been done in the past in determining configuration features in polybutadiene including some work on cross-linking. However, it has been felt that considerable more knowledge on the latter feature was desirable. In view of this, cross-linking has been studied in polybutadiene below the "gel point" using the radioactive modifier technique.

A number of polymerization features including polymerization conditions and recipe changes were investigated and a number of facts were noted, some of which are as follows: When comparing low molecular weight polymers, the cross-link density was almost linear with polymerization temperature. However, at 50°C. or 5°C. it increased with increased average molecular weight of the polybutadiene while at —18°C. it did not appear to change very much with molecular weight. The high molecular weight fraction of a low molecular weight 5°C. polybutadiene did not differ appreciably in cross-link density from the whole polymer. In the region studied, conversion did not appear to be an important factor in determining cross-linking. In addition, there was no significant difference in cross-linking caused by organic hydroperoxide catalysts as compared to inorganic peroxide catalysts.

2:30 P.M.—3—Properties of a New Fluorine-Containing Elastomer. *J. S. Rugg and S. Dixon (E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.). (Paper will be presented by Mr. Rugg).*

This new elastomer is a stable colorless material soluble in ketones. The product responds to curing agents, such as polyamines or organic peroxides, to produce strong, elastic vulcanizates. The vulcanizates have unusual resistance to deterioration at temperatures of 400° to 500°F. when in contact with air, petroleum oils, diester lubricants, and ester hydraulic fluids.

The gum may be mixed with carbon black, silica, and other fillers to improve processability and vulcanizate properties. Compounded stocks can be shaped by molding, extrusion, calendering or deposited from solutions. A vulcanization temperature of 400°F. is necessary to develop the best mechanical properties and resistance to aging. In practice, this is accomplished by a partial cure in a mold at 300°F. followed by an oven cure at 400°F.

Possible applications for this elastomer include heat- and fluid-resistant O-rings, gaskets, wire covering, and protection against corrosive chemicals.

2:55 P.M.—4—Rubbery Polymers and Copolymers Prepared with the Use of Complex Metal Catalysts. *Robert S. Aries (Robert S. Aries & Associates, New York, N. Y.).*

Using a catalyst prepared by the action of butyl lithium in $TiCl_4$, butadiene is polymerized in octane solution at 80°C. to poly-*cis*-butadiene, which is a rubber with an osmotic M.W. of about 220,000. In the stretched state, it gives a good fiber diagram with an identity period parallel to the fiber axis of 8.75 Å. Cured with a standard recipe, the rubber has a tensile strength of 5240 psi, elongation of 820%, excellent recovery and small heat build-up. It has better resistance to oxygen and solvent action than natural rubber. Copolymers of ethylene and propylene containing 1.5 to 3.0% of isoprene prepared with the aid of a catalyst from aluminum triisobutyl and $TiCl_3$ in tetralin at 90°C. are amorphous rubbery plastics at room temperature and relatively snappy rubbers above 60°C. Cured with a butyl type rubber recipe they yield rubbers resembling butyl rubber in resistance to oxygen and heat but have a better rebound. Copolymers of ethylene and butene-1 containing a few percent of isoprene are very similar to butyl rubber.

3:20 P.M.—5—Compounding Silicone Rubber for Minimum Shrinkage. *J. J. Deasy and B. B. White (Silicone Products Dept., General Electric Co., Waterford, N. Y.). (Paper will be presented by Mr. Deasy).*

New technology in the compounding of silicone rubber has resulted in compounds that have shrinkage equivalent to hydrocarbon rubber stocks. It is expected that such technology will be a definite contribution to the industry, particularly that segment producing O-rings. One benefit is reduced tooling costs because certain silicone rubber compounds can be molded in standard O-ring molds.

This technology is described in a study of the shrinkage of a certain mixed filler system in methyl siloxane type polymers. Combinations of these reinforcing fillers with proper selection of siloxane polymer makes possible compounds with shrinkage equal to that of hydrocarbon rubber compounds commonly used in the production of molded mechanical goods.

The effect of molding temperature on shrinkage is demonstrated with data from production runs of O-rings molded from 260° to 340°F. This temperature range, double that usually associated with silicone rubber, is possible through the choice of curing agents such as bis (2,4 di-chloro benzoyl) peroxide, dicumyl peroxide, and ditertiary butyl peroxides. Correlation of molding temperature, thermal expansion, Mooney cure rate and dielectric strength with shrinkage is given and the significance of each is discussed.

Graphic data illustrating the shrinkage equivalency of a silicone and a nitrile compound in the same production O-ring mold are discussed.

3:45 P.M.—6—Vulcanization of Silicone Rubber. *J. R. Harper, A. D. Chipman and G. M. Konkle (Dow Corning Corp., Midland, Mich.). (Paper will be presented by Mr. Harper).*

Increasing interest in the compounding of silicone rubber by individual fabricators, coupled with an increase in the number and complexity of factors involved in silicone rubber applications, has stimulated an interest in more information on the various phases of compounding. It is the purpose of this paper to investigate one phase of compounding, viz., the vulcanization of silicone rubber. Such vulcanizing agents as benzoyl peroxide, dichlorobenzoyl peroxide, ditertiary butyl peroxide, dicumyl peroxide, tertiary butyl perbenzoate, and others can be used in conjunction with dimethyl siloxane polymers as well as vinyl methyl siloxane copolymers.

Specific advantages as well as disadvantages are found for each type of agent with regard to such properties as durometer, tensile strength, elongation, compression set, tear strength, shrinkage, and other more specialized properties. The presence or absence of vinyl groups in silicone rubber polymers also affects behavior with different peroxides. Recommendations with regard to amount and type of agent are made with each type of silicone polymer for particular applications. Optimum conditions for molding and curing are also included.

4:10 P.M.—7—Carbon Black-Filled Silicone Rubber. *C.L. Bitner and M. L. Dunham (Silicone Div., Union Carbide & Carbon Corp., Tonawanda, N. Y.). (Paper will be presented by Mr. Bitner).*

Carbon black-filled silicone rubber compounds can now be satisfactorily cured when vinyl-containing silicone gum stocks and a di-tert-alkyl peroxide curing agent are used. The reinforcement

obtained is dependent on the nature of the carbon black. Physical properties comparable to silica-filled silicone rubbers can be obtained. Proper selection and loading of the di-tert-alkyl peroxide permits a choice of steam, hot air, or mold curing of fabricated parts. Data summarizing the physical and electrical properties obtained with furnace, channel, acetylene, and battery blacks in both general purpose and extreme low temperature vinyl-containing gums cured with either of two di-tert-alkyl peroxides are presented.

An outstanding feature of these black-filled elastomers is the high electrical conductivity. This conductivity is somewhat dependent on the black loading but is unaffected by milling or fabricating procedures. Data which show that the cured elastomers maintain their high conductivity after repeated flexing, under high extension, and at elevated temperatures are included. Properties associated with silica-filled stocks, such as thermal stability and adhesiveness, are not compromised. The stocks are easily fabricated and can be deposited from solution. A mixed silica-carbon black filler system may be used to vary the conductivity or processing properties. Potential applications include heating jackets and blankets, grounding shields, hospital goods, and anti-static or heated rolls.

4:35 P.M.—8—Tack of Pressure-Sensitive Tape. ***Franklin S. C. Chang (Mystik Adhesive Products Co., Northfield, Ill.).***

Tack as defined for printing ink [Green, H., *Ind. Eng. Chem., Anal., Ed.*, Vol. 13, p. 632 (1941) and Voet, A., and Geffken, C. F., *Ind. Eng. Chem.*, Vol. 43, p. 1614 (1951)] is inadequate for pressure-sensitive tape. It is defined as the force required to pull a tape from a standard surface with the free end of tape forming an angle of 90° to the surface, the tape being applied to the surface under the weight of the tape only. The standard method for measuring adhesion strength (ASTM D-1000-48-T) was modified to determine tack. This modified method proves to be a good substitute for the empirical finger test and puts tack testing on a quantitative basis.

The results obtained are precise enough for practical purpose and reproducible. It seems that a straight-line relationship exists between tack and thickness of adhesive film as measured by the amount of adhesive applied. This straight line is probably a characteristic of the chemical nature and physical condition of the adhesive.

Thursday Morning—September 20

Oxidation and Aging

B. S. Garvey, Jr., Presiding

9:00 A.M.—9—Formation of Microgel During Accelerated Aging of Neoprene Latex. ***Kurt L. Seligman (Jackson Laboratory, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.).***

Gelation of polychloroprene during aging of polymer latices has been postulated to occur via cross-linking at sites where 1,2-addition has occurred during polymerization. Evidence is presented which indicates formation of microgel during accelerated aging of latices. During aging, polymer intrinsic viscosity decreases and light scattering measurements show increased scattering intensities. These data which indicate microgel formation are further supported by sedimentation studies on ultracentrifuged polymer solutions. The effects of microgel on the nerve, viscosity and vulcanizate properties of polymer isolated from the aged latex are discussed.

9:25 A.M.—10—Chain Scission Efficiency in the Oxidation of Natural Rubber Vulcanizates. ***A. G. Veith (B. F. Goodrich Research Center, Brecksville, Ohio).***

The efficiency of the oxidative chain scission in natural rubber vulcanizates has been measured for a simple MBTS vulcanizate with and without antioxidants. This was accomplished by making concurrent measurements of the chain scission velocity and oxidation rate. The chain scission velocity was obtained from stress relaxation measurements which were corrected for the relaxation not due to oxygen by means of relaxation in vacuo. The reciprocal scission efficiency, defined as the number of molecules of O_2 per chain scission, was found to be 1.5 as a means for six vulcanizates both with and without antioxidant.

The decrease in network chains was found to be first order. From the theoretical analysis by Bueche, on the problem of chemical or degradative stress relaxation, such behavior has been interpreted to indicate a non-random scission process. The non-random scission takes place at the cross-linked site. The form of the dependence of the reciprocal scission efficiency on time, in vulcanizates with and without antioxidant, is consistent with non-random scission. Experiments on butyl rubber vulcanizates and the known effect of cross-link density or combined sulfur on oxidation rate further strengthen the concept of scission at the cross-linked site.

9:50 A.M.—11—Chain Scission in the Oxidation of Hevea. IV—Low Molecular Weight Products from Dry Rubber. ***E. M. Bevilacqua (U. S. Rubber Co., Passaic, N. J.).***

The yields of identifiable products from the oxidation of dry rubber are compared in this paper with previously determined yields from the oxidation of latex. In the first two papers of this series, a tentative reaction mechanism was outlined for the scission of Hevea rubber by molecular oxygen, based on quantitative estimation of volatile products associated with the scission reaction, in latex. The experiments with dry rubber at temperatures of 120-140° have led to improvements in the original mechanism, which now appears to account for the scission phenomenon nearly quantitatively.

10:15 A.M.—12—Carbon Black in the Oxidation of GR-S Vulcanizates. ***J. Reid Shelton and William T. Wickham, Jr. (Case Institute of Technology, Cleveland, Ohio). (Paper will be presented by Mr. Shelton).***

The many conflicting statements in the literature regarding the effect of carbon black in the oxidation of GR-S vulcanizates suggested a re-examination of the problem. The accelerating effect of carbon black upon the rate of oxygen absorption was confirmed. This effect cannot be explained as merely due to removal of antioxidant by adsorption on the black, since the effect was also observed with uninhibited stocks. Low loadings of carbon black decreased the rate of oxidation in certain cold rubber vulcanizates. Evidence of interaction of iron and carbon black was observed in that the usual accelerating effect of each on the oxidation reaction was diminished in the presence of the other.

The results of this study, together with other evidences from the literature, suggest that carbon black may function in several ways to alter the rate of oxidation. The net effect would then depend upon the relative magnitude of the individual effects in the vulcanizate in question under a given set of conditions. Acceleration of the rate by carbon black may be attributed to surface catalysis of the oxidation reaction, catalysis of peroxide decomposition to free radicals, adsorption of antioxidant, and (at appropriate temperatures) increased solubility of oxygen. Inhibition of oxidation by carbon black may be attributed to carbon acting as a free-radical acceptor, induced decomposition of peroxide to stable products, and deactivation of metal catalysts of oxidation.

10:40 A.M.—13—Resistance of Rubber Compounds to Outdoor and Accelerated Ozone Attack. ***C. V. Lundberg, G. N. Vacca and B. S. Biggs (Bell Telephone Laboratories, Murray Hill, N. J.). (Paper will be presented by Mr. Lundberg).***

Rubber compositions consisting principally of GR-S and a lesser number of neoprene formulations have been statically exposed outdoors in Los Angeles, Calif., Murray Hill, N. J., and Yuma, Arizona for a period of 18 months. Exposures were initiated in the summer in all three locations as well as in the

late fall in Los Angeles and Murray Hill. Observations of ozone cracking have been made periodically, and these observations have been correlated to show the relative severity of atmospheric ozone cracking at the three locations. The compounds which crack develop cracks in a shorter exposure time at Los Angeles than at Murray Hill, but at the expiration of 18 months' exposure the percentage of uncracked specimens in each location is in good agreement.

The same compounds have been statically exposed in ozone chambers operating at three different temperatures, namely 100°, 110°, and 120°F., the first one at 50 and the second and third at 25 parts ozone per hundred million of air. The data obtained in the chamber exposures have been correlated with the outdoor observations.

An additional group of compounds consisting of natural, nitrile, GR-S, and butyl rubber formulations have been exposed outdoors at Murray Hill and in the chambers to determine the relative behavior of these materials. The neoprene compounds in the first test, as well as the natural, the nitrile and the 2½ and 3 percent unsaturated butyl compounds in the additional exposures, show good correlation of outdoor ozone crack resistance data with chamber data. The 1 and 2 percent unsaturated butyl and the GR-S compounds show less correlation between outdoor and chamber results.

The relative effectiveness of waxes, antiozonants, higher than normal concentrations of antioxidants and combinations of such protective agents in the four polymers is discussed.

11:00 A.M.—Business Meeting.

11:15 A.M.—14—Goodyear Medal Lecture: Scientific Contributions to the Rubber Industry. ***Dr. S. M. Cadwell (U. S. Rubber Co., New York, N. Y.).***

Thursday Afternoon—September 20

Carbon Black and Processing

D. C. Maddy, Presiding

2:00 P.M.—15—The Chemistry of Reinforcement. I—Some Reactions Between Carbon Black and Simple Inorganic Molecules. ***M. L. Studebaker (Phillips Chemical Co., Akron, Ohio).***

The mechanism by which carbon blacks reinforce rubbers has been the basis of extensive research work. One of the phases of this work relates to a study of reactions between the carbon black molecule and chemicals, either those which are present in the elastomer or which are produced during the vulcanization step.

In an attempt to further elucidate this problem the author has carried out chemical investigations on the reactivity of various types of carbon black with a variety of simple inorganic molecules such as hydrogen, ammonia, hydrogen sulfide and sulfur.

A limited amount of data is also presented showing the effect on the physical properties of rubber vulcanizates of utilizing carbon blacks which have been pretreated with certain of these inorganic compounds. On the basis of this preliminary work it would appear that reactions involved in the vulcanization process have a marked effect upon the reinforcing properties of the carbon blacks.

2:25 P.M.—16—Carbon Blacks for Highly Conductive Rubber. ***M. H. Polley and B. B. S. T. Boonstra (Godfrey L. Cabot, Inc., Boston, Mass.). (Paper will be presented by Mr. Polley).***

A survey is given of the various parameters determining the electrical conductivity of carbon black-loaded rubber stocks. Factors such as particle size, nature and extent of the surface, concentration, degree of dispersion, particle-to-particle structure, and vulcanization reaction are discussed in connection with the explanation commonly used for the phenomenon of conductivity of black dispersions. The theoretical aspects of the conductivity of these dispersions are briefly reviewed and a simple distribution model is discussed.

By a combination of the properties which are most favorable for high conductivity, a new, unique grade of black has been developed, designated as Vulcan XC-72. Vulcan XC-72 imparts greater electrical conductivity to rubber than any presently available commercial grade of carbon black and extends the range of applications of conductive high polymers.

2:55 P.M.—17—The Organic Nature of Carbon Black Surfaces. ***J. V. Hallum (Mellon Institute of Industrial Research, Pittsburgh, Penna.).***

The possibility of the existence of reactive functional groups on the surface of carbon black which may contribute to the total reinforcing action in rubber is an intriguing problem. The results of preliminary studies to determine the existence of these groups are reported in this paper. Direct evidence for the existence of hydroxyl groups and carbonyl groups present as quinone carbonyl on the surface of some carbon blacks is given.

While the use of infrared analysis of carbon blacks is impractical in general, a carbon black of high oxygen content and of 8 to 10 m diameter was found which gave an interpretable infrared curve. Bands were noticed on the curve corresponding to either aromatic nuclei or hydrogen-bonded, conjugated carbonyl groups. Treatment of this black with diazomethane caused a shift of this band to a wave length corresponding to non-hydrogen bonded carbonyl groups.

With this as evidence, a study was begun using the polarograph as the analytical tool. Waves with half-wave potentials in a range assignable to quinone carbonyl were noted. In order to prove that these waves were not due to a peculiar reaction of the electrolyte, the reduction potentials were measured using a different salt. Blacks were extracted with the solvent and the extracts examined in order to show that the reduction potentials observed were not due solely to functional groups in the extractable material. A mechanism for the reaction of elastomers with carbon blacks is tentatively proposed in view of the foregoing.

3:20 P.M.—18—Infrared Study of Some Structural Changes in Natural Rubber During Vulcanization. ***Frederic J. Linnig and James E. Stewart (National Bureau of Standards, Washington, D. C.). (Paper will be presented by Mr. Linnig).***

Infrared studies have been made of natural rubber vulcanized with sulfur alone and also with sulfur and various accelerators. The spectral change (appearance of band at 10.4 microns) resulting from the double-bond shift observed by Sheppard and Sutherland was verified for compounds containing 2% or more of sulfur. The presence of conjugated double bonds in compounds containing 5% or more of sulfur has been indicated spectroscopically (appearance of band at 6.25 microns) and proved chemically with the aid of studies performed with squalene-sulfur reaction product and maleic anhydride.

Conjugation probably results from two double bonds in adjacent monomer units shifting toward each other along the chain. Sheppard and Sutherland have shown the double-bond shift to be correlated with the amount of combined sulfur. Zinc dibutyldithiocarbamate (BZ) increases very greatly the rate of the double-bond shift and reduces markedly the time required for conjugation to appear. However, the amount of double-bond shift occurring in BZ accelerated compounds before conjugation appears is more than that which occurs in unaccelerated compounds. Thus, one of the effects of BZ acceleration is to delay the appearance of conjugation relative to a given amount of double bond shift. Moreover, further vulcanization of these compounds does not cause as great an increase in the amount of conjugation as is caused with unaccelerated compounds. Tetramethylthiuram disulfide (TMTD) increases the rate of the double-bond shift, though to a lesser extent than BZ. However, TMTD seems to prevent completely the appearance of conjugation. Accelerated compounds also show evidence of reduced carbonyl structure and increased absorption due to OH or NH.

Conjugated systems are highly reactive. It is therefore conceivable that the foregoing is related to the fact that rubber-sulfur vulcanizates degrade more readily than do accelerated compounds and that compounds containing TMTD are relatively

quite resistant to aging. Compounds cured with TMTD alone, peroxides, gamma-rays, or sulfur dioxide and hydrogen sulfide (Peachey process) do not show definite evidence of the double-bond shift or conjugation, but show increased OH or NH absorption, decreased carbonyl structure, and in the case of the last three the presence of ionized carboxyl or nitrate groups. Apparently, the double-bond shift and conjugation are primarily phenomena related to the use of elemental sulfur.

3:45 P.M. — 19 — A Non-Blooming, High Temperature-Resistant Vulcanizing Agent for Natural and Synthetic Rubbers. *K. R. Cranker and V. H. Perrine (Thiokol Chemical Corp., Trenton, N. J.). (Paper will be presented by Mr. Cranker).*

VA-7 is a new liquid vulcanizing agent containing sulfur in a combined state which is available for vulcanization. Outstanding features of this product include such properties as its ease of dispersion, nonblooming in cured and uncured stocks and the excellent heat aging of the cured rubbers at 250° to 300°F. Stocks may be readily compounded, insuring intimate contact between the vulcanizing agent and rubber. Because of its ease of dispersion, VA-7 has gained recognition as a vulcanizing aid for white sidewall applications.

Compounds vulcanized with VA-7 for molded goods applications display excellent retention of tensile strength and flexibility in hot oils at 250°F. Benzothiazyl disulfide, litharge and Methyl Zimate may be used for acceleration of the VA-7 cures. The combination of VA-7 with a small amount of Methyl Zimate will produce rapid cures of natural, nitrile and GR-S rubber. VA-7 is moderately priced and relatively small amounts are required for complete vulcanization. Applications for which VA-7 is being used successfully include synthetic cements, mechanical goods, printing plates and rolls and numerous hot oil applications.

4:10 P.M.—20—Some Aspects of the Heat Treatment of Butyl Rubber Compounds. *D. C. Edwards and E. B. Storey (Polymer Corp., Ltd., Sarnia, Ontario, Canada). (Paper will be presented by Mr. Edwards).*

A study of the heat treatment of butyl rubber-carbon black mixes is described with particular reference to the system butyl rubber-furnace black-GMF, and with emphasis on the role of polymer gelation in systems of this kind. The effects of variations in the time and temperature of the heat treatment, of changes in the sequence of compounding operations, and in the loadings of black and promoter are shown.

From a study of the Mooney, gel, extrusion, stress-strain and hysteresis properties of the resultant mixes, it is concluded that the realization of all of the benefits of heat treatment depends upon the presence of two continuous, or semicontinuous, phases in the mix—one phase consisting of gelled polymer and containing most of the carbon black, the other phase consisting of sol polymer and containing relatively little carbon black.

The desired spatial distribution of sol polymer, gel polymer and carbon black may be achieved best by heating a high-black masterbatch in the presence of the promoter, then diluting the mix with raw polymer sufficient to yield the desired composition. Such a procedure is found to result in similar proportional benefits when applied to non-black fillers.

Friday Morning—September 21

Compounding and Testing

A. J. Northam, Presiding

9:00 A.M.—21—Influence of Petroleum Oils on Staining and Discoloration of Elastomers. *Henry M. Tramutt and Ervin G. Anderson (Gates Rubber Co., Denver, Colo.), and Fritz S. Rostler and Richard M. White (Golden Bear Oil Co., Oildale, Calif.). (Paper will be presented by Mr. Tramutt).*

The study reported in this paper was prompted by the increasing interest of compounders in stocks which are white or light colored or are designed to be in contact with such stocks. Since a number of petroleum oils are used as plasticizers or extenders for all widely used polymers, the investigation was designed to establish some generally valid facts regarding the influence of the oils on color stability and staining characteristics.

Oils representative of compositions of currently used petroleum oils and compounds based on natural rubber, GR-S, butyl rubber, nitrile rubber, neoprene, Hypalon and polyvinyl chloride containing the various oils were tested as to discoloration and migration-staining on exposure to sunlamp aging and roof aging. A conventional white sidewall compound was included in the tests as a reference.

Since all rubber compounds discolor to some extent and since the permissible degree of discoloration varies with the intended use of the compounds, permissible levels for components of the oils vary with each type of compound. The method employed in this investigation of defining petroleum oils by content of nitrogen bases, first acidaffins, second acidaffins and paraffins and of using percent reflectance to define discoloration is shown to be a suitable method for establishing permissible limits for composition of oils to be used with various polymers.

The accuracy obtainable appears to be greater than by defining oils as "naphthenic", "aromatic" and "highly aromatic". Some oils classified by O.S.R. nomenclature as "aromatic oils", i.e., oils containing only negligible amounts of paraffins, were found to be non-staining and non-discoloring in compounds for which previous work stipulated a threshold level of only 30 to 40% "aromatics". It was also found that color and color stability of an elastomer compound containing an oil cannot be predicted from the color or color stability of the oil itself.

Results of the investigation are presented in tables and graphs. The color phenomena discussed are depicted by color slides.

9:25 A.M.—22—Compounding Rubbers for Resistance to Silicate-Ester Type Hydraulic Fluids at 400°F. I—Neoprene WRT. *L. E. Nory and R. A. Clark (Battelle Memorial Institute, Columbus, Ohio). (Paper will be presented by Mr. Nory).*

This research was sponsored by the Wright Air Development Center in order to develop rubber compositions with resistance to hydraulic oils of the silicate-ester type. The objective was a rubber composition which would retain satisfactory physical properties after 500 to 1000 hours' immersion in such fluids at 400°F. One of the requirements was that the composition should have a brittle point of at least −65°F., both before and after prolonged oil aging. The silicate-ester fluids were developed for use in aircraft operating at temperatures too high for conventional petroleum-base oils. Neoprene WRT compounds were the best prior compositions that had been developed, but they remained serviceable for only three to four days when immersed in silicate-ester fluid at 400°F. Therefore, an effort was made to extend the service life of neoprene compounds.

Neoprene compounds were developed which offer advantages over previously reported compounds. The most successful ones were either partially or totally reinforced with non-black filler, plasticized with butyl oleate, and vulcanized with a combination of magnesia, zinc oxide, and NA-22. While the tensile strengths of such compounds were usually lower than those of more conventional black-filled compositions, they were superior in their ability to retain rubberlike properties after hot oil aging. As a result of this compounding study, the service life of Neoprene WRT was approximately doubled for this application.

9:50 A.M.—23—Compounding Rubbers for Resistance to Silicate-Ester Type Hydraulic Fluids at 400°F. II—Nitrile, Vinyl Pyridine, Butyl Rubber, and Acrylate Polymers. *W. J. Mueller and R. A. Clark (Battelle Memorial Institute, Columbus, Ohio). (Paper will be presented by Mr. Mueller).*

The above-mentioned types of polymers were compounded and evaluated for their resistance to silicate-ester type hydraulic fluids. Among these polymers, a butadiene-vinyl pyridine copolymer (Philprene VP-25) and a butadiene-vinyl pyridine-acrylonitrile terpolymer (Philprene VP-A) were the most promising for hot oil aging periods up to 168 hours. Their perform-

ance, however, was not quite as good as neoprene, discussed in Part I of this paper. An outstanding property of these vinyl pyridine-type polymers was their excellent low-temperature resistance. One of the best compositions was reinforced with Cab-O-Sil and cured with sulfur, tetramethylthiuram disulfide, and a quaternizing agent such as benzotrichloride. When the aging period was extended beyond 168 hours, even the best compositions with this type polymer hardened and cracked when bent double.

For longer hot oil aging periods (336 to 500 hours), the best results were obtained with Acrylon BA-12 stocks. Although the tensile strength of this polymer was low, even before aging, it did not harden or crack due to aging. The best results were obtained with stocks reinforced with either Philblack A or Hi-Sil, and vulcanized with a combination of sulfur, tetramethylthiuram disulfide, and triethylene tetramine. The inferior tensile strength probably can be improved by further studies with reinforcing fillers. The best nitrile rubber stock (Hycar 1014) was reinforced with Hi-Sil and vulcanized with small amounts of sulfur and tetramethylthiuram disulfide. After hot oil aging only 72 hours, this stock became hard and cracked when bent double. Butyl rubber vulcanizates were found to be entirely unsuitable for this application, as they disintegrated during aging.

This work indicates ways in which commercially available polymers can be upgraded to increase their resistance to silicate-ester type hydraulic fluids at 400°F. For hot oil aging periods up to 168 hours, Neoprene WRT gave the best results. For longer aging periods, Acrylon BA-12 gave much better resistance to cracking and is believed to show more promise.

10:15 A.M.—24—The Physics of the Friction of Rubber on Rough Surfaces. *F. W. Boggs and W. P. Riemen (U. S. Rubber Co., Passaic, N. J.). (Paper will be presented by Mr. Boggs).*

Friction, which leads to traction of tires on dry pavement, is not only of great technical importance in itself, but it is also a measure of the forces which lead to abrasion. Therefore, a study of how friction varies with slip should help us understand rubber loss in tires as well as their traction.

To permit the simultaneous measurement of friction and abrasion, a Lambourn type of abrader was constructed in which the frictional forces could be measured. This machine is similar to previous designs except for the brake. Instead of using a hydraulic brake or a Foucault current disk, a DC motor driven as a generator with external field excitation was employed. The current in the armature is a measurement of the torque and consequently the friction force.

It was found that if this force expressed in dimensionless terms is plotted as a function of a dimensionless variable involving slip, hysteresis and modulus, a universal curve is obtained which governs all the rubbers examined. The dimensionless quantities were obtained by scaling the equations governing the reaction of rubber to a time dependent stress. The physical significance of the shape of this curve and its bearing on the mechanism of friction and abrasion will be discussed.

10:40 A.M.—25—Elasticity and Break of Compounded Rubbers. *H. K. de Decker (U. S. Rubber Co., Passaic, N. J.).*

To obtain a rough quantitative picture of the reinforcing effect of fillers in rubbers, simple physical and geometrical assumptions about the molecules and the filler particles were used. These will be used to describe theoretically the experimental stress-strain curve of rubbers, without considering the best definition of reinforcement.

The stress-strain curves for black reinforced Hevea and GR-S differ typically from those for the corresponding pure gum compounds. These differences are found in the theoretical curves, as will be shown, and it may therefore be concluded that some essential features of reinforcement have been elucidated. The general value of this simple theory will be illustrated by calculation of the properties of Hevea and GR-S, both pure gum and black reinforced, and by brief indications of the calculations to be made in other cases.

The quantitative results obtained for GR-S and Hevea must be considered as preliminary, since much has still to be done to ascertain more correct values for the molecular quantities involved. This will be possible by means of the methods described. It is expected that ultimately these molecular quantities will prove to be more valuable in characterizing rubber vulcanizates than the conventional macroscopic data such as tensile strength, etc.

11:10 A.M.—26—A Study of Factors Affecting the Laboratory Cut Growth Resistance of L.T.P. GR-S Tread Stocks. *E. E. Auer and I. J. Schaffner (U. S. Rubber Co., Passaic, N. J.). (Paper will be presented by Mr. Auer).*

The significance of the laboratory cut growth test of GR-S tread stocks can be increased appreciably by determining the cut growth resistance of each compound tested over a wide range of cures and plotting the results as a function of modulus. The curves fitted to the data thus obtained have a high degree of reproducibility.

Utilizing this technique, it has been found that, over the 300% modulus range (M) of 800 to 2800 psi, the cut growth resistance at 150°F. (expressed as kilocycles per inch—kc/in.) of L. T. P. GR-S tread stocks approximates the following relationship:

$$\log \text{ (kc/in.)} = a - b \text{ (M)}$$

The parameters, a and b, remain virtually constant for a tread stock having a fixed loading of any given type of carbon black, regardless of the nature and amount of antioxidant or accelerator used in compounding and regardless of the extent of air aging of the vulcanizate.

With any given black the parameters, a and b, vary greatly with black loading. When, however, the cut growth resistance is plotted as a function of breaking elongation (E), the results approximate the equation:

$$\log \text{ (kc/in.)} = \alpha + \beta \text{ (E)}$$

in which α and β are nearly independent of black loading. The cut growth resistance is thus related to breaking elongation, the study indicated.

11:35 A.M.—27—Evaluation of I.S.O. Micro Hardness Tester. *Ross E. Morris and John M. Holloway (Rubber Laboratory, Mare Island Naval Shipyard, Vallejo, Calif.). (Paper will be presented by Mr. Morris).*

The micro hardness tester sponsored by the International Standards Organization has been investigated to determine its usefulness for rubber testing. This instrument is an indentometer, and is basically similar to the ASTM hardness tester. All parts of this instrument, however, are smaller and lighter than those of the ASTM hardness tester, and the movement of the indentor is measured with a microscope instead of a micrometer gauge. The purpose of the micro hardness tester is to obtain a hardness measurement on rubber items which are too small, thin and odd-shaped for testing with the instruments which generally find use today.

It was found that the micro hardness tester, as designed, was less sensitive than the Shore A durometer for the higher hardnesses of rubber, but was more sensitive for the lower hardnesses. The sensitivity for higher hardnesses was improved by increasing the weight on the indentor. The readings of the micro hardness tester showed progressively lower values, as much as 20% lower, when the thickness of the specimens of the same vulcanizate was decreased from 1/2-inch to 1/64-inch. The agreement within a series of repeat measurements made on the same shape and size of rubber specimen was acceptable.

It was concluded that the micro hardness tester is suitable for testing small, odd-shaped rubber items providing that (1) a flat or convex upper surface is available for testing, (2) the item is supported on a special mandrel when necessary, and (3) the weight on the indentor is increased when testing rubbers which are harder.

Symposium on the Literature of Rubber

Tuesday Afternoon—September 18

2:00 P.M.—1—Introductory Remarks. ***Hanna Friedenstein (Godfrey L. Cabot, Inc., Cambridge, Mass.).***

2:05 P.M.—2—The Jargon of the Rubber Industry. ***S. G. Byam (E. I. du Pont de Nemours & Co., Inc., Elastomers Div., Wilmington, Del.).***

The jargon of the rubber industry, like the lingo, cant, or argot of any specific group or industry, consists chiefly of common words or phrases to which special and not common meanings are ascribed. To individuals within the group or industry, jargon is colorful and expressive, often connoting ideas or effects difficult to describe in more precise language. For instance, "nerve" in rubber parlance suggests a condition familiar to every rubber man but so difficult to define adequately that no completely acceptable method of testing for it has been devised.

The meaning of jargon often depends on context, as a word can have several meanings. "Cure" means to vulcanize. It is also used to mean the condition bringing about vulcanization, that is, the time and temperature required. Less often and more loosely "cure" is used to mean the vulcanization agents like sulfur and accelerator.

Jargon has been used too long to be abandoned. It is too expressive to be frowned on and often is so concise that it is a great aid to readability or hearability. When used with understanding its use may be encouraged. Examples of typical jargon are given and defined.

2:25 P.M.—3—The Literature of Natural Rubber. ***T. H. Messenger (Research Association of British Rubber Manufacturers, Shawbury, England).***

This paper opens with a brief guide to sources of information relating to the early literature of natural rubber, including that concerning planting of rubber. Current literature is then surveyed by form and type. Supplementary selective bibliographies are appended. The main part of the paper discusses the application of the literature to the needs of the rubber industry today. Notice is taken of the increasing volume of rubber papers now appearing in foreign languages and a plea is made for the establishment of an effective cooperative arrangement, on an international scale, for the provision of a comprehensive translations service. An analysis is presented of inquiries received at a rubber information center and the types of literature appropriate to answering them are indicated. Since effective use of the literature depends on being able to find information as and when required, the necessity of an efficient system of classification of rubber information is emphasized.

2:55 P.M.—4—The Literature on Synthetic Rubber. ***Leora Straka (Goodyear Tire and Rubber Co., Akron, Ohio).***

The general subjects covered in this paper are research, manufacture and technology of synthetic rubber. A bibliography is appended listing a number of the books which are sources of information along with the type of information included. The nature of the information contained in the various sources of periodical literature is also discussed. Although government synthetic rubber reports are not available to the public at the present time, the types of information contained in the various classifications will be surveyed.

A.S.T.I.A. documents represent another form of government literature, which although limited to government contractors, should not be neglected when searching the synthetic rubber literature. Special publications of various technical societies, such as the Rubber Manufacturers' Association, A.S.T.M., S.A.E., etc., will be considered. Other sources of synthetic rubber literature which will be covered include the P. B. reports, U. S. and foreign patents, and various company publications.

3:30 P.M.—5—The Rubber Division Library: An Experiment in Cooperation. ***Dorothy Hamlen (University of Akron, Akron, Ohio).***

The history, organization, purpose and functions of the Rubber Division Library, with some specific examples of actual problems, are presented.

3:45 P.M.—6—Classification Schemes for the Literature of Rubber. ***Lois W. Brock (General Tire and Rubber Co., Akron, Ohio).***

Of the classification schemes intended for arranging books on library shelves, the 14th edition of Dewey's *Decimal Classification* lists the single number, 678, for rubber. The 15th edition expands this, making use of eight major divisions under 678. The Library of Congress system, which is based on the large collection at the Congressional Library, uses notations involving letters of the alphabet and numerals to provide detailed coverage of the field.

More extensive schemes for bibliographic classification include the Universal Decimal Classification and the Dawson Code. The fourth English edition of the UDC appeared in June, 1954, and is available in this country as British Standard BS 1000:678/679 (1954). It goes into much greater detail than the Dewey schedule on which it is based. Synthetic polymerization products, including rubber, are minutely subdivided by chemical type.

The scheme of the Research Association of British Rubber Manufacturers, often called the "Dawson Code," uses a series of letters and numbers for a thorough-going breakdown of information on rubber. A revised edition which appeared recently includes an abridged version for smaller collections.

4:05 P.M.—7—Reclaimed Rubber: A Guided Tour Through the Literature. ***H. A. Winkelmann (Dryden Rubber Division, Sheller Manufacturing Corp., Chicago, Ill.), and J. M. Ball (Midwest Rubber Reclaiming Co., East St. Louis, Ill.). (Paper will be presented by Mr. Ball).***

The earliest known bibliography was prepared by H. A. Winkelmann and E. G. Croakman, "Survey of Scrap and Reclaimed Rubber Literature," which covered the subject up to January 1, 1930. That bibliography has never been published. There is then a five-year gap before the first edition of the "Bibliography of Rubber Literature," in 1935. That bibliography, now published by the Division of Rubber Chemistry, American Chemical Society, is expected to be up to date, and on an annual basis, by 1958.

An attempt at a complete bibliography through 1955 is now being made under the direction of the authors, with the object of consolidating Winkelmann and Croakman's survey with the reclaimed rubber references in the "Bibliography of Rubber Literature." Dr. Winkelmann will fill in the five-year gap, 1930-1934.

The present paper consists of a list of general sources of information on reclaimed rubber, a resume of important developments in the industry, a selected bibliography and a glossary.

Wednesday Morning—September 19

9:00 A.M.—8—Introductory Remarks, ***Hanna Friedenstein (Godfrey L. Cabot, Inc., Cambridge, Mass.).***

9:05 A.M.—9—Rubber Compounding Information: Sources, Searching, Recording and Retrieval. ***Kathleen S. Rostler (The Rubber Formulary, Bakersfield, Calif.).***

A brief survey is given of the sources of compounding information, with particular emphasis on the technical releases of chemical suppliers to the industry, which constitute the most important source of information on practical factory formulations.

Methods of finding and indexing this type of material are dis-

cussed. The difficulties in searching are explained by the fact that, in contrast to most technical literature searches, the material being sought is usually not references to a particular topic, but individual recipes which have been published in a number of widely scattered technical papers or releases.

Indexing methods which have been used to overcome these difficulties are discussed critically and existing indices are described. The use of marginally punched cards for recording, filing and finding individual published compounding formulations is discussed. The file card used in The Rubber Formulary for abstracting published literature is explained in detail as an example of using this type of filing system. Additional types of coding and indexing are suggested and explained.

The possibility of converting information gathered in a punched card file to tabular form in a permanent handbook, such as the now out-dated "Rubber, Physical and Chemical Properties," by T. R. Dawson and B. D. Porritt, is suggested.

9:40 A.M.—10—Patent Searching in the Field of Rubber Technology. *T. A. O'Brien (Goodyear Tire and Rubber Co., Akron, Ohio).*

This paper discusses the following topics: the volume of material to be searched; objectives of the search; requirements of a patent classification system; how patents are classified in the U. S. Patent Office; the Classification Manual; the Index to Classification; Classification Bulletins; how these are used; constant revision of the U. S. Patent Office system of classification; foreign patents; distribution of rubber industry patents throughout the patent classification system; classification of patents relating to certain segments of industry, i.e., natural and synthetic rubber, tires, boots and shoes, rubber coatings; private collections of rubber patents.

10:05 A.M.—11—Standards and Specifications for Rubber and Rubber Products. *J. J. Allen (Firestone Industrial Products Co., Akron, Ohio).*

This paper includes: (1) Definitions of standards, specifications and recommended practices as used by the rubber industry; (2) The sources of specifications in the rubber industry including technical societies, industrial technical committees and associations, and Federal and Military bodies preparing specifications; (3) Discussion of the make-up and scope of each of these groups and the type of specification issued by each; (4) An appendix showing the main specification-issuing bodies in this country, together with the address and source of the various specifications issued by them.

10:25 A.M.—12—Government Reports on Rubber. *P. S. Greer (National Science Foundation, Washington, D. C.), and James Kanegis (Office of Technical Services, Washington, D. C.). (Paper will be presented by Mr. Greer).*

There is no single index to unclassified government publications on rubber. The largest catalogued group covering the years since World War II is in the PB collection of the Office of Technical Services, Department of Commerce. O. T. S. distributes printed copies while the Library of Congress handles orders for unprinted copies. Both LC and OTS also service some 3,600 unclassified reports of the Office of Synthetic Rubber (and its predecessor organizations) which operated the Government synthetic rubber plants.

The Government Printing Office prints, catalogs, and distributes many agency reports on rubber, publicity being secured through its Monthly Catalog and indexes. Overlapping with OTS is negligible. Most Government agencies will service individual inquiries whether covered by existing reports or not. Nevertheless, a comprehensive search should be conducted personally with the guidance of agency personnel. A knowledge of government organization helps considerably, this being obtainable through suitable guides.

Other agencies furnishing some reports on rubber include the following: Atomic Energy Commission, National Bureau of Standards, Bureau of the Census, Business and Defense Services Administration, Tariff Commission and various segments of the Departments of Labor, Agriculture, and Defense. Classified data and reports involve a different approach, their availability being determined through suitable clearances. The Armed Services Technical Information Agency is an important source in this category.

10:50 A.M.—13—Sources of Market Information on Rubber, Rubber Raw Materials, and Rubber Products. *H. N. Stevens (Goodrich Research Center, Brecksville, Ohio).*

As background information for rubber industry market research, studies of attempts by the British to restrict natural rubber production and by the Germans to control synthetic rubber supplies are mentioned. Sources are given for statistics on crude rubber production, prices and trade. Sources are given for statistics on raw materials for making synthetic rubber, including butadiene, styrene, isobutylene and acrylonitrile, synthetic rubber production, synthetic rubber prices, and synthetic rubber trade. Sources of reclaimed rubber production, prices and trade are given.

The literature on current consumption of all types of rubber is reviewed together with various projections of consumption until 1975. End-use data is given for all kinds of rubbers in major consuming countries and reference is made to the most complete recent U. S. studies on the amounts of various rubbers used in different rubber products. Sources of general economic statistics on the rubber industry are discussed. Alternate sources of identical statistics are given for the benefit of libraries with limited collections.

11:10 A.M.—14—New Publication Plans of the Division of Rubber Chemistry. *Norman Bekkedahl (National Bureau of Standards, Washington, D. C.), R. G. Seaman (Rubber World, New York, N. Y.), and David Craig (B. F. Goodrich Research Center, Brecksville, Ohio). (Paper will be presented by Mr. Seaman).*

Courses in rubber technology presented in recent years by the local rubber groups sponsored by the Division of Rubber Chemistry are being supplied to the New Publications Committee of the Division. An Editorial Committee will select the best lecture on each of the several subjects and will furnish copies of these lectures to the chairman of each local rubber group educational committee. The Division will publish a compilation of the selected lectures as an elementary textbook of rubber technology.

The Division is considering the publication of a fifth annual volume of its journal *Rubber Chemistry and Technology* for the purpose of presenting specially prepared and up-to-date reviews of important subjects in the literature of rubber chemistry and technology, patterned after *Chemical Reviews*.

Instead of a revision of the monograph "Chemistry and Technology of Rubber," by Davis and Blake, a series of short monographs to fill certain gaps in the literature of rubber chemistry and technology will be prepared. It is hoped that the first such monograph will be published in less than two years. In effect, the publication of these short monographs will result in a revision of the 1937 Davis and Blake monograph but on the installment plan.

11:30 A.M.—15—How Rubber Literature is Created: Preparing the Technical Paper. *M. E. Lerner (Rubber Age, New York, N. Y.).*

Technical papers form the heart and soul of the technical literature, and any errors which occur in the original manuscripts may be carried through the literature for all time. Accordingly, if a few relatively simple rules are followed by the authors in their original presentations entire industries benefit. These rules are outlined and discussed. Suggestions for greater cooperation between author and editor are made, all designed to result in better technical papers, from the standpoint of both technical content and presentation. Some reference is also made to the problems faced by publishers in selecting the better types of papers and in avoiding duplication of material.

Editorials . . .

End of an Era

THE die has been cast with regard to the ultimate disposition of the government-owned synthetic rubber facilities on West Wilbeth Road in Akron. As reported elsewhere in this issue, President Eisenhower on July 26 signed a bill authorizing disposal of the laboratory and pilot plant. Specifically, the bill transferred the property from the jurisdiction of the National Science Foundation to the General Services Administration, and calls for sale of the facilities to any interested government agency and subsequently, if no satisfactory bid or arrangement is made, to the public.

Actually, operations at the Akron facilities were officially ended on June 30, although a skeleton force is still in evidence. Practically all of the technologists—chemists, engineers, physicists, etc.—have already found spots either directly within the rubber industry or in the petrochemical field closely allied to the industry. The final payroll period showed some 130 employees. The latest government report indicated a book value of $545,000. The facilities were originally built at a cost slightly over $2,000,000, and present replacement value is estimated at $3,750,000.

Under the terms of the new legislation, the General Services Administration is required to ascertain the value of the Akron laboratories and pilot plant to any interested government agency. Obviously, it is prohibited from making any public sale at a price less than that which may be stated by any such agency, which is somewhat on the ambiguous side. The only government agency which has indicated a real interest to date is the Department of Agriculture. At least eight private firms have also expressed an interest within recent months. It should prove quite interesting to see how GSA handles bids involving taxpayer money versus private capital. It is anybody's guess, but we believe the final figure for the facilities will be close to the $1,000,000 mark.

A bit of history is in keeping with the final disposition of the Akron laboratories. Both the laboratories and pilot plant were constructed by the Rubber Reserve Co., successor government agency to the Office of the Rubber Director. They were formally dedicated on June 28, 1944, with operation placed in the hands of the University of Akron. James A. Schade, one-time director of research for the B. F. Goodrich Co., was the first manager named, followed in succession by Dr. G. S. Whitby and Dr. W. K. Taft. The facilities were built on the recommendation of the Technical Committee of the Office of the Rubber Director, headed at the time by Col. Bradley Dewey.

In making the principal dedication address, Col. Dewey stated that "the nation's scientists are determined to produce a better synthetic rubber than any tree rubber ever produced" and predicted that "before the new pilot plant and laboratory reach their first birthday we will have a far better understanding of synthetic rubber." The prediction was prophetic, but after twelve years we are still trying to produce a synthetic rubber which will equal and surpass in all characteristics and properties nature's own material. The closest we have come to date is with the relatively new *cis*-polysioprene rubbers, which yet remain to be proved.

The disposition of the Akron facilities virtually brings the end to an era—an era marked by the closest cooperation ever displayed by an entire industry with a central government. This era witnessed the pooling of all patents which enabled the synthetic rubber industry to be born while the Akron facilities played a most important role in the blossoming of that industry. The findings of the laboratories were available to all rubber manufacturers and fostered additional company research with far-reaching results. The hundreds of published articles and reports emanating from the Akron laboratories will serve as a monument to their successful operations.

The "Rex" Rubber Contract

WITHIN the past few days the "Rex" Rubber Contract went into effect on the Commodity Exchange. The present "Standard" Rubber Contract will be traded in concurrently with the new one. The new contract is a futures contract and the present futures contract—the No. 1 R.S.S. Contract—will terminate at year-end. Like the present "Standard" contract the need for the new "Rex" contract was called for by continued shortages in the availability of eligible No. 1 Ribbed Smoked Sheets. The word "eligible" is most important in this instance, since it refers to the tight RMA description of top grade rubber. The salient features of the new contract are covered elsewhere in this issue, but we have it on good authority that the details are rather academic where the average rubber manufacturer is concerned. It does spell out the fact, however, that any lot which is inferior to No. 1 R.S.S. is eligible for delivery provided it is determined that the quality of the lot is not inferior to one-half the difference between Nos. 1 and 2 R.S.S.

Highlights Sidelights *of the News . . .*

August, 1956

President Eisenhower has signed the bill authorizing disposal of the government-owned synthetic rubber laboratories located at the University of Akron . . . The bill names the General Services Administration to handle the sale of the facilities which were formerly operated by the University of Akron . . . The bill requires GSA to offer the facilities first to other government agencies before putting them up for sale to private interests . . . The U. S. Department of Agriculture is reported to be interested in acquirng the laboratories (page 821).

Members of the New York Commodity Exchange have adopted a new rubber futures contract to be known as the "Rex" rubber contract . . . The new contract went into effect August 1 . . . The present "Standard" contract will be traded in concurrently with the new Rex contract . . . The other rubber futures contract, the No. 1 R.S.S. Contract, now being traded, will terminate in December, 1956 (page 823).

Firestone has announced a 40,000 ton expansion of its synthetic rubber plant at Lake Charles, La. . . . When the expansion is completed in December, the plant will have an annual capacity of 190,000 long tons . . . When the plant was purchased from the government it had a capacity of 99,600 long tons . . . The Lake Charles plant is now producing GR-S type rubber at a rate in excess of its present design capacity of 150,000 long tons annually (page 825).

Six major rubber firms which have been indicted on charges of fixing prices on the sale and distribution of industrial drive belts pleaded innocent to the charges at a recent hearing held at the U.S. District Court, Denver, Colo. . . . The six companies have been given until September 17 to file motions . . . Hearings on the motions will be held in mid-October (page 821).

Far East steamship lines have set up a special task force to consider the problem of contamination of rubber shipped from Malaya, Indonesia and lesser rubber export areas . . . The ship lines plan an intensive study of stowage methods in an attempt to alleviate the problem which has been costing thousands of dollars a year (page 822).

A special report from our Malayan correspondent notes that increasing competition from synthetic rubber, growing demand, and high production costs are forcing Malayan rubber growers to consider replanting with high-yielding varieties . . . The report outlines major problems now confronting the Malayan producer (page 826).

NEWS REPORTS and Industry Activities

PRESIDENT SIGNS LEGISLATION FOR SALE OF GOVERNMENT LABS

On July 26, President Eisenhower signed a bill authorizing disposal of the government-owned synthetic rubber laboratories located at the University of Akron, Akron, Ohio. The bill names the General Services Administration to handle the sale of the facilities which were formerly operated by the University. As amended by the Senate Banking and Currency Committee, the bill requires GSA to offer the facilities first to other government agencies before putting them up for sale to private companies. It is reported that the U. S. Department of Agriculture has expressed an interest in acquiring the laboratories.

The bill to dispose of the laboratories was drawn up by the National Science Foundation. NSF, in sending up the disposal bill, told Congress that the market was such as to offer the government a "sizable recovery" of its investment in the laboratories. Eight industrial firms and non-profit research institutes have indicated an interest in acquiring the facilities, according to NSF.

The bill, as signed, differs from earlier legislation on disposal of synthetic rubber facilities in that no national security clause is included. This feature of the bill is particularly significant in that a buyer would have a free hand in dismantling any or all of the facilities. With a requirement to maintain the laboratories as is, it is felt that it would be considerably more difficult to dispose of the facilities.

The University of Akron discontinued its operations at the laboratories in June of this year. The University had operated the laboratories on a cost-plus-fee basis since 1944 and had been offered a lease through June, 1957, rent-free and without government subsidy. The University felt, however, that the endeavor would be a losing proposition without the support of the government. Officials at the University estimated that it would take an annual business volume of $1,000,000 to operate the laboratories at a break-even point. Operating cost to the government during the last fiscal year was $950,000.

The laboratories originally cost the government $2,000,000 to construct. GSA now expects bids for the facilities to approach the $3,750,000 level, a figure representing the current replacement cost.

Hormones For Rubber Trees?

British rubber scientists have discovered a new way to double the output of rubber in Malaya thereby increasing that country's ability to compete with synthetic. The discovery, made by the Rubber Research Institute, could mean an increase of more than 1,000,000,000 pounds of rubber a year from both estates and smallholdings. After more than two years' research on the project, scientists have found the new method particularly applicable to trees of more than 20 years. At present, the Malayan government is spending millions in getting rid of old rubber in a gigantic replanting scheme in order to compete with synthetic. Now, old trees can be made to produce latex simply by the application of hormones every six months on the outer bark, it is reported. A second semi-circular cut is then made on the opposite side of the trunk and the tree is bled. One of Malaya's leading planters has hailed the development as "one of the greatest steps forward in the natural rubber industry in the past 20 years."

New York Rubber Terminal Set

Agreement has been reached on establishing a centralized rubber-importing terminal on the New York City-owned Piers 12 and 13, Staten Island, N.Y., according to an announcement by Vincent A. G. O'Connor, Marine and Aviation Commissioner, and R. D. Young, president of the recently formed Rubber Terminal Corp. They agreed that all now required for the terminal is the preparation of a lease and its approval by the Board of Estimate. They noted that the board had given its informal approval to the plan to keep the rubber-importing business in New York City. Rubber Terminal Corp. had agreed to pay the city 50 cents a ton for all cargo passing over the piers each year up to 200,000 tons, and $1 a ton on all in excess of that figure. The corporation had also agreed to a guaranteed minimum annual rental of $50,000.

SIX RUBBER COMPANIES PLEAD NOT GUILTY TO PRICE FIXING

Six rubber firms which have been indicted on charges of fixing prices on the sale and distribution of industrial drive belts have pleaded innocent to the charges at a recent hearing in U.S. District Court, Denver, Colo. The defendents are the B. F. Goodrich Co., Akron, Ohio; the Goodyear Tire & Rubber Co., Akron; the Gates Rubber Co., Denver; the U. S. Rubber Co., New York, N. Y.; the Boston Woven Hose & Rubber Co., Boston, Mass., and the Dayton Rubber Manufacturing Co., Dayton, Ohio. The six rubber companies were given until September 17 to file motions. The presiding U.S. District Judge said hearings for the six firms would be held in mid-October.

A Colorado grand jury charged the rubber firms with fixing prices on the sale and distribution of industrial drive belts. The indictment, under the Sherman Anti-Trust Act, specifically charges that the rubber companies conspired to fix uniform list prices, rates of discounts, terms and other conditions for the sale of the V-belts. The companies were also charged with setting up agreements to increase the prices of the belts by lowering the rate of discount from list prices and fixing effective dates for the price changes. The indictment also alleged that the firms sold approximately $60,000,000 worth of rubber V-belts in 1954 alone.

The maximum penalty on conviction is a fine of $50,000. A one-year prison term under law does not apply since no officials were named in the indictment.

Rogers Acquires Cellular Rubber

Rogers Corp., Rogers, Conn., has purchased Cellular Rubber Products, Inc., Willimantic, Conn., and has announced plans for increasing production capacity of the new acquisition. Cellular Rubber makes cellular and mechanical rubber products for special purpose aircraft and electronics applications. Rogers produces specialty materials for the plastics, automotive and other fields. The addition of Cellular Rubber will extend the line in several Rogers-serviced industries. The entire Cellular work force of some 50 employes will be retained, boosting Rogers' personnel total to about 450.

STEAMSHIP LINES TO CONSIDER PROBLEMS IN STOWAGE METHODS

According to the New York rubber trade, Far East steamship lines that carry rubber to New York and other ports have set up a special task force to consider the problem of contamination of rubber shipped from Malaya, Indonesia and lesser rubber export areas which has been costing thousands of dollars a year. The ship lines plan an intensive study of stowage methods. An expert cargo surveyor will be named within the near future to survey stowage methods on various lines and make recommendations for an industry-wide program to solve the loss problem.

During the past, there have been many methods used to prevent shipments from fusing together or getting stuck in transit. These include talc washes, burlap separators, treated papers, vinyl or polyethylene sheets. Fused bales of rubber are not lightly separated. Insurance companies have paid as much as $3,000 in extra labor to tear a shipment of bales apart and clean off fragments of unsatisfactory separators. Ship lines have had to send gangs of longshoremen to Boston and other ports so they could chop out fused rubber from the sides of holds.

The leading concerns involved in the rubber import trade are Isthmian Steamship Co., Barber Steamship Lines, Mitsui Line, Moller Steamship Co., Booth American Line Shipping Corp., and Furness, Withy & Co. Ships bring into New York about 30,000 tons of rubber a month. The carrying methods and the methods of preparing shipments abroad are so varying that insurance companies have been pressing the lines to standardize procedures.

Each bale of rubber weighs about 250 pounds. The crepe rubber, most susceptible to what the trade calls contamination, is worth about $85 a bale. Ships bring in an average of 3,500 to 4,000 tons, according to insurance spokesmen, at a freight rate of about $31 a measurement ton, which means forty cubic feet. The "all risks" insurance rate on the commodity is 28 cents for $100 of value.

Releases Study Report

One of the leading insurers, in collaboration with Isthmian, recently made public a report resulting from a study of twenty rubber voyages on Isthmian freighters. The bales had been stowed on the so-called bale ends, so that burlap patches kept the bales from fusing. No claim was filed on any of these shipments.

The two companies urged other lines to employ the "new" method, but the other companies replied that end-to-end stowage was not new and not the answer. They have proposed to go into the problem extensively and seek a final answer to the costly contamination problem.

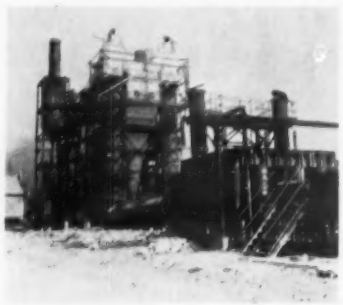
Cargo surveyors say rubber formerly was shipped in individual wooden crates. This usually worked, although there was damage when splinters worked into the rubber, and this process was expensive. The lines tried clay-coated papers. On the crepe bales they tried various talc treatments, but the talc created a problem in unloading and turned rubber into a "penalty" cargo calling for higher longshoreman wages.

Vinyl films also stuck and had to be torn off, leaving fragments that had to be cleaned, an expensive operation. Polyethylene, when properly used, worked fairly well, but the methods were not standard and bales that were too tightly wrapped could not "breathe" and they, too, became contaminated.

The problem has grown since the war, because of a deterioration in handling methods in the Far East. Moreover, the processing methods declined and there were even some shipments of unsatisfactory rubber that had been buried during the war. The ship lines that will embark on the improvement campaign this week are members of the New York Agents Committee of the Far East Lines. They represent the homeward movements of shipping firms that are members of the Far East Conference.

Witco Opens New Black Plant

A new carbon black plant with an annual capacity of 25,000,000 pounds was opened on June 20 by the Continental Carbon Co., an affiliate of Witco Chemical Co. of New York, N. Y. Robert I. Wishnick, chairman of the Witco board, said that the furnace-type plant, first of its kind to be built



First photograph of the new SRF carbon black plant opened in Eunice, New Mexico, by Continental Carbon, showing combustion chambers and (in background) the collection system.

in New Mexico, will produce semi-reinforcing furnace carbon black through the controlled combustion of natural gas. It will bring Witco's total capacity of all grades of carbon black to approximately 300,000,000 pounds annually. The 36-year-old firm, whose steady expansion reflects in part the growing need for high quality carbon blacks, now operates 15 plants producing a variety of chemicals. In building the new plant, whose process equipment includes four gas-fired furnaces and auxiliary facilities, future expansion was taken into consideration, Mr. Wishnick said. The gas-treating plant and control house, as well as the gas-collecting system with its 40 miles of piping were all designed for production greater than initial plant capacity.

"Vulcan 6 in Oil-Extended GR-S Treads" is the title of Technical Report RG-10 issued by Godfrey L. Cabot, Inc., Boston, Mass.

FIRESTONE SEES GROWTH TREND IN EUROPEAN RUBBER INDUSTRY

Harvey S. Firestone, Jr., chairman of the Firestone Tire & Rubber Co., Akron, Ohio, returned to the United States on June 26 from an inspection tour of his company's manufacturing and sales facilities in Europe. Speaking of business conditions in Western Europe, he said: "Business conditions in Europe today are better than they have been at any time since the end of the Second World War.

"One of the most encouraging developments in Europe today is the increasing use of techniques to create new markets and to expand existing markets in the manner we in the United States have employed for some time. This is being accomplished in Europe through increased and more intensive research programs and improvements in productivity.

"Through research new products are being developed and old products are being improved. Greater productivity, made possible through improved production methods and investments in new and better equipment, has resulted in raising real incomes and the standard of living. In short, intensified research and greater productivity are contributing greatly to Europe's general prosperity.

Notes Strong Growth Trend

"The activity in the rubber manufacturing industry in Western Europe continues to reflect the strong growth trend characteristic of the industry throughout the world. Consumption of rubber in this area between 1950 and 1955 increased 67%, from 327,750 to 548,000 long tons. In the United States during the same period the increase was from 1,258,557 to 1,529,699 long tons, or 21.5%.

"Because of the general prosperity, there has been a remarkable increase in the registration of motor vehicles in Europe. Between 1950 and 1955 the increase in Great Britain, France, Western Germany and Italy was 63%. This compares with an increase of 28% in the United States during the same period.

"Capacity for the production of tires in our European plants has been increased by approximately 50% during the last two years. And because of the increase in motor vehicle registration all Firestone plants in Europe are running at full capacity."

While abroad, Mr. Firestone visited plants and sales offices in England, France, Germany, Portugal, Spain and Austria. He also attended a conference in Brentford, England, of Firestone foreign production executives from the European plants and from plants in India, South Africa and New Zealand. Mr. Firestone was present at the 100th anniversary celebration of the company's affiliate in West Germany, Phoenix Gummiwerke A. G.

Rohm & Haas has announced price reductions for its acrylic products, including Plexiglas sheet, Plexiglas molding powders and methyl methacrylate monomer. Price reductions range from 3 to 9½%.

NEW RUBBER FUTURES CONTRACT ADOPTED BY COMMODITY EXCHANGE

Members of the New York Commodity Exchange, Inc., have adopted a new rubber futures contract, entitled the "Rex" Rubber Contract, which went into effect on Wednesday, August 1. The present "Standard" Rubber Contract will be traded in concurrently with the new contract. The other rubber futures contract, the No. 1 R.S.S. Contract, now being traded, will terminate in December, 1956.

Recurrent shortages in the availability of eligible No. 1 Ribbed Smoked Sheets made advisable the introduction of the present "Standard" Contract, and also the recommendation by the Board Rubber Trade Group for adoption of the proposed new "Rex" Contract, in order to permit the delivery of No. 1 Ribbed Smoked Sheets of a quality equal to the bulk of current production of this grade in producing areas.

Pertinent features of the new "Rex" Rubber Contract are:

(1) The contract (basis grade) is No. 1 Standard Quality Ribbed Smoked Sheets, Exchange Type, which is equal to RMA/RTA No. 1 R.S.S.

(2) A lot which is inferior to No. 1 Standard Quality Ribbed Smoked Sheets shall be eligible for certification and delivery, provided the Inspection Bureau determines that the quality thereof is not inferior to ½ of the difference between No. 1 Standard Quality Ribbed Smoked Sheets and No. 2 Ribbed Smoked Sheets (RMA/RTA Type and Description). A lot determined by the Inspection Bureau to be inferior to No. 1 R.S.S. within such inferiority range shall be subject to a discount prevailing at the time of delivery as fixed on the 15th day of the month prior to the delivery month and shall prevail on all such deliveries in the subsequent month (see new Section 1005A for composition, duties and jurisdiction of the Differential Committee).

(3) The minimum weight of each packager shall be 224 pounds—the maximum weight shall be 250 pounds—with customary trade tolerance.

(4) A unit may contain slightly stained bales not in excess of 10% of the unit, provided that the stains do not penetrate the wrapper. A unit containing any such stained bales up to 10% is subject to an allowance of ¼c per pound on 10% of the total net weight of the unit.

(5) Rubber from any Government stock pile (domestic or foreign) shall not be eligible for certification. (*Note:* This does not apply on deliveries against the Standard Contract.)

(6) All rubber in warehouse submitted for original certification must have been registered with the Eastern Weighing and Inspection Bureau. (Not required on re-certification.) (*Note:* This does not apply on deliveries against the Standard Contract.)

Trading may be conducted in the following delivery months within any period of 15 months: January, March, May, July, September and November.

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SID RICHARDSON CARBON ANNOUNCES APPOINTMENT OF KEACH AND GINGOLD

J. R. Keach

G. D. Gingold

Sid Richardson Carbon Co., Fort Worth, Texas, has announced the appointment of J. R. Keach as sales manager and Gilbert D. Gingold as special representative of the company, both with offices at Akron, Ohio. Mr. Keach succeeds F. A. Bonstedt, who is retiring in December of this year. Mr. Bonstedt, who has been associated with the company since its organization in 1948, will continue to serve in a consulting capacity. Mr. Keach, who until recently was vice-president of the Thermoid Co. at Trenton, N. J., has been associated with the rubber industry for approximately 30 years. Mr. Gingold, who received his master's degree from Akron University, was formerly associated with the Goodyear Tire & Rubber Co., Akron, as a tire compounder and with the Naugatuck Chemical Division of the U. S. Rubber Co., New York, N. Y., working in the development and evaluation section.

Minnesota Mining Promotes Two

The promotions of Maynard H. Patterson and Kenneth J. Shea to new positions in the international operations of the Minnesota Mining & Manufacturing Co., St. Paul, Minn., have been announced by Clarence B. Sampair, president. Mr. Patterson, for the past five years vice-president and general manager of Minnesota Mining & Manufacturing of Canada Ltd., London, Ontario, has been named vice-president and general manager of the International Division and will be responsible for the over-all operation of activities outside the United States. Mr. Shea, vice-president and general sales manager of the International Division since 1954, has been promoted to vice-president and general manager of Minnesota Mining's Canadian subsidiary.

Standard-Sheller Merger Approved

Merger of the Standard Products Co., Cleveland, Ohio, into the Sheller Manufacturing Corp., Portland, Ind., has been approved by stockholders of both concerns. Each of the companies is a diversified producer of automotive and other products. Under Indiana law, the merger cannot become effective until after a 30-day wait and subsequent approval by the boards of both companies. The agreement calls for exchange of two shares of Sheller common for three of Standard common. There are no preferred shares. With the merger, Sheller's authorized capital stock would be $2,500,000 shares of common, $1 par value, of which about 1,451,000 will be issued and outstanding.

Rubber Research in India

A Rubber Research Institute and a Central Rubber Institute with one or two zonal research centers will soon be established in India. A decision to this effect was taken at a meeting of the representatives of the Indian Rubber Industries Association, the Association of Rubber Manufacturers in India, the Ministry of Commerce and Industry, the Rubber Board, and the National Chemical Laboratory. It was decided at the meeting that a cess on the consumption of rubber, both indigenous and imported, should be levied and the collections made available for meeting the expenditures of the proposed research activities. It was also decided to have a fifteen member committee for the time being, consisting of 8 representatives (3 from Indian Rubber Industries Association, 3 from the Association of Rubber Manufacturers in India, and 2 from other rubber manufacturers). The other 7 members are to be drawn from other interested bodies.

Named Marketing Director

Willard deCamp Crater, Jr., has been named marketing director of the Polymer Chemicals Division of W. R. Grace & Co., New York, N. Y. Mr. Crater was previously associated with the Naugatuck Chemical Division, U. S. Rubber Co., New York, as manager of Marvibond sales. With Naugatuck since 1950, he also served as manager of vinyl sales and assistant manager of plastics sales.

ASTM Committee D-24 Formed

At its organizational meeting in Atlantic City, N. J., on June 22, Committee D-24 on Carbon Black of the American Society for Testing Materials elected as its chairman Sherman H. Doner (Raybestos-Manhattan). The committee also elected as vice-chairman, C. A. Carlton (J. M. Huber); and secretary, A. G. Cobbe (Godfrey L. Cabot). The committee approved the organization of six subcommittees and appointed chairmen as follows: *Physical Tests*, Frank Svetlik (Phillips Petroleum); *Chemical Tests*, L. G. Mason (Goodrich); *Optical Tests*, H. A. Ambrose; *Nomenclature*, John Tallant (Phillips Chemical); *Sampling*, R. O. Treat (Continental Carbon), and *Coordination* (with other committees), B. S. Garvey, Jr. (Sharples Chemicals). Thirteen Methods of Test for Carbon Black, developed by the Carbon Black Industry Analytical Committee, have been submitted to Committee D-24 for consideration. These methods have been published in the July, 1956, issue of the *ASTM Bulletin*. Committee D-24 is also sponsoring the distribution of a number of reprints of these methods to interested groups in this country and abroad.

Lerner to Address Conference

The National Industrial Exposition to be held on October 22 to 26 at the Artillery Armory in Detroit, Mich., will feature a "Non-Metallics Day." Scheduled for October 26, the Non-Metallics Day will consist of a conference by a panel of manufacturing experts who will cover new ideas for industry in the fields of rubber, plastics, chemicals, wood, paper and textiles. The session is to be moderated by editors of top industrial publications. M. E. Lerner, editor of RUBBER AGE, will moderate the session on rubber. The conference is part of an important series of management-engineering sessions planned to cover the newest developments in specific industrial fields. The exposition itself, featuring all kinds of new industrial products, new methods and research developments, will be open from 11:30 A.M. to 5:30 P.M. daily. Exposition headquarters are at 927 Book Building, Detroit 26, Mich.

Expanding Torrance Plant

Shell Chemical Corp., New York, N. Y., has announced that a new unit to produce a special latex for the manufacture of foam rubber products will be completed at the Torrance, Calif., synthetic rubber plant this fall. Other parts of the plant's general expansion program include extensions to the butadiene facilities and modernization of the copolymer unit. These phases of the program will also be completed in the fall. The first stage of the modernization program began soon after the company bought the plant from the government last year, the company stated, and other stages were added as the need became evident. When construction is completed, the copolymer plant will be able to make 110,000 long tons of a broad range of rubber types a year, as compared to its original capacity of 89,000 tons of a more restricted range, both figures assuming adequate raw material supplies are available.

ANNUAL RUBBER AGE AWARD PRESENTED AT UNIVERSITY OF AKRON

The annual prize of $100 for the student who prepares the best term paper or the best thesis for his degree in rubber chemistry has been presented by RUBBER AGE to Eugene Mooney at the University of Akron. Mr. Mooney received the award for submitting the outstanding master's thesis. The thesis, entitled "The Kinetics of Polymerization of Octamethylcyclotetrasiloxane", dealt with the effect of solvents on the polymerization of silicone rubber. Mr. Mooney was one of fourteen students who received an M.S. degree at the University this June.

The RUBBER AGE Award was established in 1955 and was first presented to Fred J. Kovac and Kermit C. Beach for their joint thesis on "A Compounding Study of Butyl Rubber." The selection of the prize winning paper or thesis is made by a special board consisting of Dr. Maurice Morton, professor of polymer chemistry and director of the Rubber Research Institute at the University of Akron; Dr. Thomas Sumner, professor of chemistry, and Professor Emeritus G. Stafford Whitby.

The new award winner, Eugene Mooney, was born in Dorchester, Mass., on April 23, 1929. He received his A.B. degree in chemistry from Harvard University in 1951, and was graduated from Akron University in June, 1956, with an M.S. in polymer chemistry. He is currently employed at the B. F. Goodrich Research Center, Brecksville, Ohio, where he is engaged in new polymer and compounding research and in new product development. He is a member of the Division of Rubber Chemistry of the American Chemical Society and the Akron Council of Engineering and Scientific Societies. Mr. Mooney is also circulation manager for "Akron Technical Topics." Mr. Mooney is married and resides in Akron, with his wife and one-year old daughter.

Eugene Mooney

3M Tape Patent Upheld

The United States District Court at New York City has upheld the basic cellophane tape patent of the Minnesota Mining & Manufacturing Co. Judge Alexander Bicks, sitting in New York's southern district, has filed an opinion ruling the 3M patent to be valid and infringed by the Technical Tape Corp., New York, N. Y. The New York litigation began in 1951 when Technical Tape filed a declaratory judgment suit asking for a declaration that 3M's "Drew" patent was invalid, that Technical Tape was not infringing the patent, or both. 3M filed a counterclaim asking for an injunction to stop Technical Tape from infringing the patent and requesting an accounting of damages. The "Drew" patent has been upheld in previous infringement suits in Chicago and the Seventh Circuit.

Plastics Abstracts Available

British Plastics Federation, London, England, has announced the publication each month of abstracts of technical articles from journals throughout the world dealing wholly or partly with plastics developments. The service also includes the publishing of patents from the countries which have an important plastics industry. Abstracts are available in bound or unbound versions, the service costing £10.10s a year. Photostat or microfilm copies of most articles can also be obtained from the Federation, whose offices are 47-48, Piccadilly, London, W. 1., England.

OAP Sells Rohm & Haas Stock

The government's stock holdings in the Rohm & Haas Co., Philadelphia, Penna., representing about 7.8% of the outstanding capital stock of the chemical firm, have been sold by the Office of Alien Property to a syndicate headed by Kidder, Peabody & Co. and Drexel & Co., both of New York, for $34,405,649. This offer was the highest of four bids received in response to a bid invitation issued by OAP in May. The government offering consisted of 79,210 shares of common stock and 4,810 shares of preferred stock. The bidder's offering price was $428.2512 a share for the common and $100.33 a share for the preferred. The holdings had been seized by the Alien Property Custodian during World War II from its enemy owners. About 60% of the remaining outstanding capital shares in the company is believed to be owned by the Haas family and certain charitable institutions.

Joins Controlled Rubber

Arthur Solgas, with Thompson Products, Inc., for 18 years, has joined Controlled Rubber Products, Inc., Willoughby, Ohio, as production manager. At Thompson, Mr. Solgas served as supervisor of chemical quality engineering in the Rubber Department. In his new position, he will supervise the production of custom engineered products, including bondings of molded rubber metals. Mr. Solgas was trained in chemical engineering at Fenn College.

FIRESTONE ANNOUNCES EXPANSION OF SYNTHETIC RUBBER PRODUCTION

A 40,000-ton expansion of synthetic rubber production facilities at Lake Charles, La., has been announced by Harvey S. Firestone, Jr., chairman of the Firestone Tire & Rubber Co., Akron, Ohio. When completed in December, this plant will have a capacity of 190,000 long tons annually. When purchased from the Government 15 months ago, its capacity was 99,600 long tons. The Lake Charles plant now is producing "FR-S"-type rubber (successor to government-produced GR-S) at a rate in excess of its design capacity of 150,000 tons annually.

In Akron, Ohio, new facilities went into production during the last week in June to increase output of this plant from 30,000 to 40,000 tons annually. This addition will give Firestone the capacity to produce 230,000 tons annually by the end of 1956. The synthetic plants at Akron and Lake Charles had a combined annual capacity of 129,600 tons in April, 1955, when Firestone purchased them.

Purchase and expansion of the two plants at Lake Charles and Akron, plus a planned petrochemical center in the southwest, represent a multimillion dollar investment by Firestone in the synthetic rubber industry. The petrochemical center, located in Orange, Texas, will include a plant to manufacture annually 40,000 tons of butadiene.

Besides constructing new manufacturing facilities and creating more jobs in its synthetic rubber plants, Firestone has instituted new product control programs designed to produce higher quality synthetic rubber than any ever made, Mr. Firestone stated. Firestone produces approximately 25 types of synthetic rubber in solid and liquid form. These are used by the company in making tires and other products and are sold to hundreds of companies engage in the manufacture of a long, diversified list of products. Firestone also produces natural rubber on 90,000 plantation acres in Liberia, West Africa, and the company is developing plantations in Brazil, the Philippines and Guatemala.

NBS To Relocate Laboratories

A tract of approximately 550 acres of land near Gaithersburg, Md., has been selected for relocation of the Washington, D. C., laboratories of the National Bureau of Standards. The move will permit the Bureau to plan new buildings to replace present research facilities, which over the past 50 years have become inadequate for current needs. Congress appropriated funds for site acquisition and preliminary planning early in June, after details about the proposed site had been presented to House and Senate Appropriations Committees. Plans for the site have been given to the National Capital Planning Commission and to the Regional Planning Council, and it is expected that these groups will work with the Bureau in utilizing the land. The General Services Administration will participate in planning and will supervise construction. Transfer of operations to the new location is expected to be completed in about five years.

PROMOTION OF HAWKES AND CUTHBERTSON ANNOUNCED BY U.S. RUBBER CO.

H. N. Hawkes

G. R. Cuthbertson

Howard N. Hawkes, vice-president, has been elected a member of the board of directors and a member of the Executive Committee of the U. S. Rubber Co., New York, N. Y., effective September 1, 1956. G. Raymond Cuthbertson has been elected a vice-president and named general manager of the Tire Division, succeeding Mr. Hawkes. Mr. Hawkes started with U. S. Rubber in 1912 and specialized in selling both solid and pneumatic truck tires in New York City. He was appointed district sales manager for tires in Chicago, Ill., in 1927 and named general sales manager for the Tire Division in 1934. In 1944, Mr. Hawkes was appointed assistant general manager of the Tire Division and in 1951 was elected vice-president and named general manager of the Tire Division. Mr. Cuthbertson joined U. S. Rubber in 1936 as a research chemist. During his career with the company, he has been assistant director of tire development at Detroit, Mich., factory manager in Los Angeles and production manager of the Tire Division at the general offices in New York City. Mr. Cuthbertson was named assistant general manager of the Tire Division of the U. S. Rubber Co. in January of this year.

New Dichloroprene Bibliography

A complete revised comprehensive bibliography of the literature on "G-4" (Dichlorophene) has been recently published by the Sindar Corp., New York, N. Y. The bibliography, "Technical Bulletin D-2," contains abstracts of some 109 scientific trade articles, as well as abstracts of 12 patents, both foreign and domestic. The index of the bulletin is divided into seven major categories including: biological properties, compatibility, patents, physical and chemical properties, test methods, toxicological properties and uses. Copies are available upon request from the Sindar Corp., 330 West 42 Street, New York 36, N. Y.

Goodyear Personnel Changes

Three major personnel changes in the Coatings Department of the Chemical Division, Goodyear Tire & Rubber Co., Akron, Ohio, have been announced by Herman R. Thies, general manager of the division. John W. Warner, manager of the division's St. Louis district since 1952, has been promoted to manager of the Coatings Department. Gordon H. Campbell, special representative in the Charlotte, N. C. sales territory, has been made assistant manager of the department. Charles S. Baker III, joining the Chemical Division with several years of experience in the textile field, has replaced Mr. Campbell as special representative in the Charlotte sales territory.

Appointed Anchor Chairman

Thomas Martin, managing director of the Anchor Chemical Co., Ltd., Manchester, England, has been appointed chairman of the company. He succeeds the late Thomas H. Hewlett, who died recently after having held the office for more than 21 years. Mr. Martin will retain the position of managing director to which he was appointed on March 5, 1945. Born in Manchester in 1892, Mr. Martin entered the rubber industry about 50 years ago with the Holt Town Rubber Co. He joined the Anchor Chemical Co. in 1914 and began his duties by assisting in the establishment of laboratories and in helping in the company's sales advertising. In 1923, he was elected to the board of directors and became the assistant managing director in May, 1941.

Goodrich Promotes Lehmann

Fred N. Lehmann, formerly staff superintendent of the B. F. Goodrich Co., Akron, Ohio, has been appointed plant superintendent of the Akron tire plant. Mr. Lehmann joined the company in 1940 as a time study man. After experience in that field in the Aeronautical, Industrial Products and Tire Divisions, he was named process engineer in the Tire Division in 1946. Mr. Lehmann was graduated from the Carnegie Institute of Technology where he was a nationally prominent football player in 1934-1936.

REPLANTING A MAJOR PROBLEM TO MALAYAN NATURAL RUBBER PRODUCERS

According to a special report from a Malayan correspondent, increasing competition from synthetic rubber, growing demand, and high production costs are forcing Malayan rubber growers to consider replanting with high-yielding varieties. This special report, which follows herewith, outlines major problems now confronting the Malayan producer, taking into account over-all effect upon the Malayan economy. The report follows:

The natural rubber industry is the backbone of Malaya's economy. Some idea of its importance not only to Malaya but to the sterling area may be gained from the following facts:

(1) Planted acreage totals 3,750,000.

(2) Production is close to 600,000 tons a year and will increase.

(3) Exports (including re-exports from neighboring countries) average 1,000,000 tons a year.

(4) Exports during 1955, valued at M$2,330,000, represented 56% of total exports.

(5) Last year Malaya earned U.S.$170,000,000 for the sterling area from rubber sales to Canada and the United States.

(6) The industry, through export taxes and income taxes, contributes about 50% of the Federation Government's revenue.

(7) Of Malaya's labor force of 470,000, some 300,000 are employed on rubber estates of over 100 acres. Roughly a million people are dependent on small holdings of under 100 acres which constitute 40% of the total planted acreage.

Cites Consumption Rate Increase

The short, half-century history of the rubber industry shows clearly that consumption increases by at least 50% every ten years. The increase was greatest in the early 1900's when the motor car was being developed, but scientific research continues to add many new uses for rubber. For example, one potentially important new use is in roads. It has been found that powdered rubber mixed with asphalt gives roads a longer life, plus greater resilience to shock and to climatic changes. If rubberized roads come to be accepted, the demand for powdered rubber would be phenomenal.

The increased demand for rubber in the last 20 years has been met by the synthetic product and natural rubber now supplies only about half of the world's requirements. It is doubtful if synthetic rubber will ever replace the natural type, as has happened in some commodities—dyes, for instance—but the natural rubber industry knows that drastic improvements will have to be made if it is to maintain its competitive position.

To those who are interested in the welfare of Malaya, there is one answer to the questions of increasing demand, high production costs and competition from synthetic—replanting old trees with new high-yielding varieties.

Average production from trees planted up to 1940 is less than 400 pounds per acre per year. New types available since the war will produce up to 1,500 pounds per acre. Thus, theoretically, Malaya can produce at least three times as much rubber with only a moderate increase in costs.

Replanting on the scale necessary to keep the industry competitive means a tremendous investment, and this is the crux of the problem of the natural rubber industry. A special commission appointed to examine the industry said in its report that "there is very little chance at present of new outside capital being invested in rubber in Malaya." The reasons, they said, were (1) After a war "men's minds naturally turn to security and they become less inclined to take risks," (2) Rewards from investment in natural rubber are not commensurate with risks, (3) The threat from synthetic rubber is very real, (4) Political developments add uncertainties about the future.

Declining Output Forecasted

The alternatives to new capital investment are financing from profits, forced savings by a levy on production, government loans and grants. All these methods are being used but because it takes seven years to bring a rubber tree into production, there will be no increase in output for some time to come. A period of static or declining production must be accepted until replanted areas come into bearing.

Of the 2,000,000 acres of estate rubber, about one-third has been replanted, with the estates themselves meeting the cost out of depreciation funds, reserves and profits. However, since the middle of 1955 they have been helped by a grant of M$400 per acre (or about half the total cost) for every acre replanted in the next seven years, up to a maximum of 21% of each estate's planted acreage. Some of the more efficient estates have already exceeded this percentage.

The problem of replanting 1,700,000 acres of smallholders' rubber is more difficult. Their few acres of rubber trees are, for most smallholders, their only means of livelihood and to be without this source of income for a number of years is not attractive, to say the least. Even the incentive of a M$500 per acre grant has not produced the desired results. An additional deterrent to replanting at the present time is the relatively high price for crude rubber on the world market.

Considering New Plantings

In addition to replanting, a good deal of thought has been given to new planting—opening up new areas now covered with virgin or secondary jungle. Although clearing jungle and planting rubber trees is as costly as replanting, the great advantage is that production from old trees is not stopped. However, the disadvantage is that all the best land is already planted and only more difficult types of terrain are available.

The present schemes for replanting and new planting over the next 10 years are estimated to cost M$280,000,000. Fortunately, through levies and grants about M$200,000,000 is available at the moment but it may take more than this to induce smallholders to take action.

Two New RC Plasticizers

Two new plasticizers have been announced by the Latex and Chemical Division of Rubber Corporation of America, Hicksville, N.Y. One of these new plasticizers is said to be a low cost replacement for normal octyl decyl phthalate (NODP). Called "RC Plasticizer D-31", it is a premium blend of di-isodecyl phthalate and di-isodecyl adipate which functions as a low temperature plasticizer for polyvinyl chloride. Unusually good efficiency and performance has been reported. The new product exhibits lower volatility, reduced water sensitivity and better heat stability when compared to blends of the more common dioctyl phthalate and adipate. The other new RC Plasticizer, "DIDP-10", has been formulated for wire coating application and for use in films, hose, floor tile, plastisols, outerwear, upholstery, etc. According to the manufacturer, DIDP-10 is designed to improve low temperature brittle points in polyvinyl chloride compounds while maintaining the low volatility characteristic of the higher phthalate esters. Users have reported excellent electrical qualities, resistance to extraction by soapy water and low specific gravity added to compounds built around DIDP-10 as the primary plasticizer.

Indonesian Tire Production

According to estimates by the U. S. Department of Commerce, manufacture of automotive tires in Indonesia meets the major portion of that country's demand. It is reported that in 1955, 175,587 passenger and motorcycle tires were produced in Indonesia; 149,844 truck and bus tires, and 1,463 implement tires. In the preceding year, 161,000 passenger and motorcycle tires were produced; 155,837 truck and bus tires, and 1,055 implement tires. As for tubes, the Commerce Department puts Indonesian production of automotive tubes in 1955 at 290,680 units. In the previous year, 324,889 tubes were produced. By far the largest category in the Indonesian tire production picture revolves about bicycle tires. In 1955, Indonesia produced 3,039,317 bicycle tires and 1,559,587 bicycle tubes. In 1954, 2,624,889 bicycle tires and 1,527,720 bicycle tubes were turned out.

New Cyanamid Publication

The Petrochemicals Department of the American Cyanamid Co., New York, N. Y., has commenced publication of a new series of technical bulletins called "Petrochem Lines." Volume 1, Number 1 of the new series deals with acrylonitrile. Articles within the four-page bulletin cover such subjects as acrylonitrile in surface coatings; acrylonitrile and halogens; amines derived from acrylontrile, etc. Future editions of the bulletin will attempt to provide a broad information service on up-to-date developments and possible applications of acrylonitrile and its derivatives.

A technical data sheet describing the physical properties of a newly-developed potting compound is now available from Bacon Industries, Inc., Watertown, Mass.

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CONNECTICUT GROUP OFFERING ELASTOMER TECHNOLOGY COURSE

The Connecticut Rubber Group has announced a series of twelve lectures devoted to "Basic Rubber Technology," beginning September 12, from 7:30 to 9:45 p.m., and continuing on Wednesday evenings thereafter. The lectures will be delivered at the Sterling Laboratory of Chemistry at Yale University, New Haven, Conn. The lecture series will deal, in a broad way, with the chemistry and technology of natural and synthetic elastomers. The first five lectures in the series will be concerned with the elastomers. Talks on compounding ingredients, physical testing of rubber, processing equipment and plant layout will follow. The series will be concluded with a lecture on latex and foam sponge.

The lectures will be given by specialists in the various fields. Sufficient time has been allotted to the different subjects to permit rather comprehensive coverage. The Connecticut Rubber Group feels that the course will serve to give newer compounders and technologists a broad background. It will also serve the more experienced as a review and as an opportunity to be brought up-to-date.

Enrollment fees for the course are $15.00 for group members and $16.00 for non-members. Registration can only be accomplished by mail. Those desiring additional information or those desiring to register for the course should contact O. J. Lang, K.B.C. Industries, Inc., 881 State St., New Haven, Conn. There follows herewith the program for the course:

September 12—Natural Rubber and Reclaimed Rubber.

September 19—Butadiene-Styrene Copolymers.

September 26—Butyl Rubber and Silicone Rubber.

October 3—Neoprene, Hypalon and Isocyanates.

October 10—Butadiene-Acrylonitrile Copolymers and Thiokol.

October 17—Carbon Blacks.

October 24—Non-Black Compounding Ingredients.

October 31—Accelerators.

November 7—Antioxidants, etc., and Polymer Degradation.

November 14—Testing of Rubber, Compounding for Specific Effects, and Measurement of Physical Properties.

November 21—Rubber Processing Equipment and Plant Layout.

November 28—Latex and Foam Sponge Rubber.

Appoints Engineering Aid

Sun Rubber Co., Barberton, Ohio, has established an Industrial Engineering Department to keep pace with its plans for expanding production of consumer and industrial products. Albert Edelman, previously associated with the Weatherhead Co., Cleveland, Ohio, has been made manager of the new unit. Mr. Edelman served as chief industrial engineer at Weatherhead. Last year he conducted a 10-week course on general management problems for the Cleveland chapter of the American Management Association.

BUTT SUCCEEDS BEAUREPAIRE AS CHAIRMAN OF OLYMPIC INDUSTRIES

Charles S. Butt

Ian Beaurepaire

Charles S. Butt has been elected chairman of Olympic Consolidated Industries Ltd., Melbourne, Australia, following the death of Sir Frank Beaurepaire, founder of the company. Ian Beaurepaire, Sir Frank's son, has been made vice-chairman. Mr. Butt, wartime controller of rubber for the Australian Commonwealth Government, has been associated with the group since the Olympic Tyre & Rubber Co. began manufacturing activities in Melbourne in 1934. The new vice-chairman, Mr. Beaurepaire, is general manager of the tire company. He was recently elected as a Melbourne City Councillor in the ward formerly held by his father, who was Melbourne's Lord Mayor from 1940 to 1942. Assets of the companies founded by Sir Frank exceed £10,000,000 sterling. The group has factories in Victoria and Queensland and maintains branch offices throughout other sections of the country.

Forms Aviation Division

Manufacturing and selling functions of the Aeronautical Departments of the B. F. Goodrich Co., Akron, Ohio, have been combined into a single operating division to be known as B. F. Goodrich Aviation Products, a division of the B. F. Goodrich Co. P. W. Perdrian, formerly director of employe relations, and E. H. Fitch, formerly executive assistant to the vice-president-employe relations, have been appointed general manager and general manager-sales, respectively, of the newly created division. At the same time, C. B. McKeown has been appointed general manager, rubber products manufacturing; J. H. Seaton, general manager, wheel and brake manufacturing, and W. D. Matthews, treasurer.

Fire Strikes Bayshore Plant

The foam rubber goods plant of Bayshore Industries, Inc., Elkton, Md., which was destroyed by fire on July 13, is expected to be back in operation within two to three months, according to a statement by Alvin Gursha, plant manager. The fire, the third in recent months, caused damage estimated as high as $80,000. Mr. Gursha said the contents were valued at close to $75,000. The Elkton Co., owners of the building, estimated its value at $5,000. It was a concrete block building with a tin roof. The plant employs about 45 men, two of whom were on duty when the fire broke out. They were unable to shed any light, however, on the origin of the fire.

Kersker Appointed Manager

Ted M. Kersker, formerly chief textile engineer for the Goodyear Tire & Rubber Co., Akron, Ohio, has been appointed manager of fabric development for all tire divisions. Mr. Kersker is responsible for the quality of textiles and adhesives used in tires produced by the company and for the development of new adhesives, textiles and processes. He brings to his new assignment more than 18 years of experience in the compounding of natural and synthetic rubbers and the compounding and production of plastics. A native of Cincinnati, he was graduated from the University of Cincinnati in 1938 with a B.S. degree in chemical engineering. A member of the American Institute of Chemical Engineers and Alpha Chi Sigma, a professional chemistry fraternity, Mr. Kersker also is a member of the Rubber Division of the American Chemical Society.

Hercules Tall Oil Production

Hercules Powder Co., Wilmington, Del., has announced that its two new tall oil fractionation plants are expected to yield 115,000,000 pounds of rosin and fatty acids out of the 140,000,000 pounds of raw material processed a year. One of the new plants, at Franklin, Va., is now on a shakedown production basis. The second tall oil plant at Savannah, Ga., identical to the Franklin plant, is expected to start production at the end of the third quarter of this year.

Akron Group Holds Outing

Approximately 975 members and guests attended the annual outing held by the Akron Rubber Group on June 14 at the Firestone Country Club in Akron, Ohio. Feature of the outing was a golf tournament and a decathalon contest which included such events as a golf sandtrap escape, golf putting, golf approach, football accuracy, dart accuracy, softball accuracy pitch, basketball foul shooting, ring toss, coin toss and horseshoes. A shot putt contest was an extra added event. Winners in the golf tournament included the following: *Low Gross*, John Cseh (Firestone); *Long Drive and Accuracy*, John Rowe (Firestone); *Secondary Accuracy*, J. B. Cook (Wooster Rubber); *Blind Bogey*, R. B. Sherwood (Goodrich), Clyde Brenneman (Wooster Rubber) and F. E. Toonder (Columbia-Southern). George Popp (Phillips Chemical) served as chairman of the Outing Committee. He was assisted by the following sub-chairman who took charge of the events noted: *Prizes*, Mel Vaughn (Witco Chemical); *Decathalon*, Maynard Bobbitt (Firestone); *Food and Arrangement*, L. V. Cooper (Firestone); *Tickets*, Cather Louthan (Godfrey L. Cabot); *Parking*, Bob Whipple (Firestone) and Bill Campaign (Goodyear).

Smith Addresses Thiokol Club

The Thiokol Technical Club dinner-meeting which was held on June 4 at the Thiokol Chemical Corp., Trenton, N. J., attracted an audience of approximately 200 technicians, chemists and engineers active in rubber and allied industries. Principal speaker at the meeting was Dr. Walter R. Smith, associate director of research at Godfrey L. Cabot, Inc., who spoke on the "Basic Aspects of Reinforcement." Dr. Smith discussed, with the aid of slides, the use of carbon blacks as rubber-reinforcing agents. Although it is common knowledge that the addition of carbon blacks (and sometimes silicas) strengthens rubber, he said, there is some question as to whether or not the reaction which results in reinforcement is a physical or chemical one. The speaker believes that the reinforcing phenomena are physical rather than chemical. One thing implied by the results of research, he went on, is that the smaller the particle of the reinforcing pigment, the greater the amount of reinforcement achieved. The particle, moreover, to be effective in its role, must be spherical, he concluded.

SPI Plans Annual Meeting

Plans for the 1957 Annual National Conference of the Society of the Plastics Industry, Inc., to be held in Los Angeles, Calif., next year, will be formulated at a meeting scheduled by James Prior, chairman of the SPI Pacific Coast Section on August 22 in that city. At that time, plans will also be advanced for the proposed Pacific Coast Plastics Exposition to be sponsored by the Society. More information will be announced on the plans for these affairs following the August 22nd meeting.

Coming Events in the Rubber Industry

Aug. 17. Philadelphia Rubber Group, Manufacturers' Golf & Country Club, Oreland, Penna.

Sept. 7. Ontario Rubber Section, Dundas Valley Golf and Country Club.

Sept. 8. Connecticut Rubber Group, Summer Outing.

Sept. 13. No. California Rubber Group, Golf Outing, Castlewood Country Club, Pleasanton, Calif.

Sept. 18-21. Division of Rubber Chemistry, A.C.S., Chalfonte-Haddon Hall, Atlantic City, N. J.

Sept. 27. Fort Wayne Rubber & Plastics Group, Hotel Van Orman, Fort Wayne, Ind.

Sept. 28. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

Oct. 2. Buffalo Rubber Group, Fall Meeting.

Oct. 2. Los Angeles Rubber Group, Statler Hotel, Los Angeles, Calif.

Oct. 5. Boston Rubber Group, Fall Meeting, Hotel Somerset, Boston, Mass.

Oct. 5. Detroit Rubber & Plastics Group, Fall Meeting, Detroit-Leland Hotel, Detroit, Mich.

Oct. 5. New York Rubber Group, Henry Hudson Hotel, New York, N. Y.

Oct. 11. No. California Rubber Group.

Oct. 11-12. Society of the Plastics Industry, New England Section Conference, Wentworth Hotel, Portsmouth, N. H.

Oct. 25. So. Ohio Rubber Group.

Oct. 26. Akron Rubber Group, Mayflower Hotel, Akron, Ohio.

Oct. 26. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Nov. 2. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

Nov. 8. No. California Rubber Group.

Nov. 8. Rhode Island Rubber Club, Fall Meeting, Pawtucket Country Club, Pawtucket, R. I.

Nov. 14. No. California Rubber Group.

Nov. 16. Connecticut Rubber Group.

Dec. 4-5. Society of the Plastics Industry, Seventh Film, Sheeting and Coated Fabrics Division Conference, Commodore Hotel, New York, N. Y.

Dec. 5. Buffalo Rubber Group, Xmas Party.

Dec. 6. Fort Wayne Rubber & Plastics Group, Hotel Van Orman, Fort Wayne, Ind.

Dec. 7. Detroit Rubber & Plastics Group, Xmas Party, Sheraton-Cadillac Hotel, Detroit, Mich.

Dec. 7. No. California Rubber Group, Xmas Party, Orinda Country Club.

Dec. 14. Boston Rubber Group, Xmas Party, Hotel Somerset, Boston, Mass.

Dec. 14. New York Rubber Group, Xmas Party, Henry Hudson Hotel, New York, N. Y.

Dec. 15. So. Ohio Rubber Group.

Dec. 21. Chicago Rubber Group, Xmas Party, Morrison Hotel, Chicago, Ill.

Jan. 25, 1957. Akron Rubber Group, Mayflower Hotel, Akron, Ohio.

Jan. 25, 1957. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Feb. 15, 1957. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

Mar. 15, 1957. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

Apr. 26, 1957. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

May 15-17, 1957. Division of Rubber Chemistry, A.C.S., Joint Meeting with Rubber Chemistry Division of C.I.C., Sheraton-Mount Royal Hotel, Montreal, Que., Canada.

U. S. Rubber Promotes McGovern

John W. McGovern

John W. McGovern has been elected executive vice-president of the U. S. Rubber Co., New York, N. Y., effective September 1, 1956. He will succeed H. Gordon Smith, who will retire after 39 years of service but who will continue as a member of the board of directors. Mr. McGovern was also elected vice-chairman of the executive committee. A native of Philadelphia, Mr. McGovern joined U. S. Rubber in 1920 as an accountant in Boston. A year later he was placed in charge of factory accounting at the East Cambridge, Mass., plant, and in 1923 was made office manager. He later served as supervisor of industrial engineering and as control manager of various divisions of the company. In 1938, Mr. McGovern was named assistant manager of operations in the Tire Division, and in 1940, assistant general manager of the division. During World War II, he was appointed general manager of the newly formed Munitions Division, and became general manager of the Tire Division in 1943. Mr. McGovern was elected a vice-president in 1945 and a director and member of the executive committee in 1951.

Hooker-Oldbury Plan Merger

Officers of the Hooker Electrochemical Co. and the Oldbury Electro-Chemical Co., both of Niagara Falls, N.Y., have announced that they are negotiating for a merger of Oldbury into Hooker by the issuance of 450,000 shares of Hooker common stock in exchange for the 10,000 shares of Oldbury presently outstanding. The Oldbury main plant is situated adjacent to the Hooker Niagara Falls plant. A second recently completed plant is located at Columbus, Miss. The consolidation will result in broadening Hooker's basic product lines, which now include phenolic resins and plastics.

Quality Tools Corp. Formed

A new firm, Quality Tools Corp., 108 Nassau Road, Roosevelt, Long Island, N. Y., has been set up to manufacture models and molds for use in the vacuum forming of plastic sheet materials. Its president is Sanford S. Zimmerman, who is chairman of the Machinery Section, Sheet-Forming Division of the Society of the Plastics Industry.

Military Specification Issued

Military Specification MIL-M-19379 (SHIPS) which covers a rubber resilient mounting for use aboard naval vessels has been issued recently by the Department of the Navy. The mounting is specified to have a natural frequency from 16 to 11 cycles per second over a load range from 15 to 25 pounds. It is expected that this specification will be expanded to include mountings covering the load ranges 5 to 15 pounds and 25 to 50 pounds with similar natural frequency characteristics. Mountings furnished under this specification shall be ones which have been tested and have passed the qualification tests described in the specification. Normally, awards will be made only for those mountings which have been approved for inclusion on the applicable Qualified Products List prior to the bid opening date. Manufacturers are urged to arrange to have the mounts which they propose to offer the Government tested for qualification in order that they may be eligible to be awarded contracts or orders for these mounts.

Mueller Named Vice-President

Karl W. Mueller has been named vice-president and director of manufacturing of the Crown Cork & Seal Co., Inc., Baltimore, Md. In his new position, Mr. Mueller will be responsible for directing and coordinating the manufacturing operations of all thirteen of the company's plants located throughout the U.S. Mr. Mueller's experience in plant operations and in related fields of engineering covers 25 years, beginning with his employment as a cadet engineer with the Brooklyn Union Gas Co. soon after his graduation from Cornell University with a mechanical engineering degree in 1932. Before joining Crown, Mr. Mueller was vice-president of operations of Trailmobile, Inc., a subsidiary of Pullman, Inc. After post-graduate work in industrial management, he received his M.S. degree from Stevens Institute of Technology in 1942.

Appointed Executive Reservists

Secretary of Commerce Sinclair Weeks has designated 83 executive employes of private industry as members of the National Defense Executive Reserve established by the President February 15, 1956. This Reserve group will serve with the Business and Defense Services Administration of the Department of Commerce in event of a future mobilization emergency. Among the executives who agreed to serve in this Reserve are George W. Flanagan and George A. Fowles, B. F. Goodrich Chemical Co.; George E. Peterson, Simplex Wire & Cable Co.; Albert H. Wechsler, Converse Rubber Corp., and Stuart E. Yeaton, John A. Roebling's Sons Corp.

Acquires New Warehouse

Martin Rubber Co., Long Branch, N. J., has acquired a two-story building which will be used for additional warehouse space. The new building is located one block from the present factory. Martin manufactures a line of bathing accessories, household and mechanical goods, sponge rubber goods, etc.

Jaeger Named General Manager

Robert W. Jaeger

The board of directors of the Automotive Rubber Co., Inc., Detroit, Mich., has announced the appointment of Robert W. Jaeger as general manager of ARco Rubber Processors, Houston, Texas. As head of ARco Rubber Processors, Mr. Jaeger replaces Richard D. Bailey, who has been moved up to general lining superintendent of all ARco Divisions. Before joining ARco, Mr. Jaeger spent seven years as sales engineer and market analyst with the Sid Richardson Carbon Co., Akron, Ohio. Prior to this, he served as a technical sales engineer and assistant lubricants manager with the Standard Oil Co. of Indiana. A Bostonian by birth, Mr. Jaeger received his education in Massachusetts schools and was graduated as a chemical engineer.

Mohawk Rubber Appointments

The election of Charles E. Sauvain as vice-president of the Mohawk Rubber Co., Akron, Ohio, has been announced by H. M. Fawcett, president. With Mohawk since 1915, Mr. Sauvain has served as sales manager and secretary of the company for the past two years. Over the years he has had various assignments, including credit manager and treasurer. He has been a member of the board of directors since 1944. It was also announced that William T. Ernst has been elected secretary and treasurer of the company, succeeding Mr. Sauvain as secretary and Mr. Fawcett as treasurer. Mr. Ernst joined Mohawk in 1946, after being associated with several management consulting firms. At the same time, the appointment of Thomas C. Johnson as sales manager was made known. Until recently, Mr. Johnson has been manager of the company's Eastern Division.

Polyvinyl Chemical Incorporates

Polyvinyl Chemicals, Inc., Peabody, Mass., has announced its incorporation. The new company was formerly a division of the Stahl Finish Co. Officers elected by the board of directors are Max Potash, president; Harold Naidus, vice-president in charge of development; Samuel S. Stahl, vice-president; and Louis E. Stahl, secretary-treasurer. This company manufactures acrylic copolymer emulsions and specialty vinyl-acetate copolymers for use in the leather, textile, paper and adhesive industries.

New Light-Stabilizing System

The development of a new light-stabilizing system for vinyl, which has withstood 5,600 hours of accelerated artificial weathering before failure, has been announced by the Organic Chemical Division of the Monsanto Chemical Co., St. Louis, Mo. Joseph R. Darby, group leader in charge of plasticizer application research, said that outdoor confirmatory tests on the new system are not entirely complete due to the excessive time factor involved. However, they indicate that the new stabilization provides approximately three times the outdoor durability that has been obtainable heretofore in vinyl plastic.

The remarkable increase in light stability, Mr. Darby said, is attributable to the proper combination of resin, plasticizers and a complex, four-part stabilizer system which is significantly impaired by the omission of any one of the parts. He described the stabilizer parts as barium-cadmium, an epoxidized soybean oil, an antioxidant and an organic additive. All of the system's components are available commercially and at a cost only slightly higher than present stabilization systems, according to Mr. Darby. Monsanto does not produce or sell stabilizers, but the company has made patent application on the stabilizing system as it did in the case of the heat stabilization system which it introduced in 1951. The latter is used today in an estimated 75% of transparent vinyl film formulations.

Goodrich Research Personnel

B. F. Goodrich Co. Research Center, Brecksville, Ohio, has announced the promotion of two members of the Research Center staff and the addition of three new staff personnel. Jerard Sindelar, who joined the Research Center staff in 1946, has been assigned to the chemical engineering research and development department. James R. Miller, who for 13 years has held various assignments in the research and development departments, has been named as a research chemist at the Research Center. Miss M. Jane Ferguson, formerly with the General Electric Co. Research Laboratory and Ciba Pharmaceutical, Inc., has joined the staff in a junior technical capacity. Another new staff member is Samuel J. Caprette, Jr., previously associated with James H. Herron Co. and the General Tire and Rubber Co., who has been assigned to the technical service research group. E. Ray Hooser, formerly employed by Dow Corning Corp., has joined the Research Center staff as an analytical chemist.

Textileather Begins Expansion

Textileather Division of the General Tire & Rubber Co., Toledo, Ohio, has started a $2,000,000 expansion program at its Toledo plant. The main part of the expansion will be a 33,000-square-foot building that will house a modern 92-inch calender for the manufacture of vinyl fabrics and vinyl sheeting. The project will be a modern one-story building with a four-story section.

Reelless Wire Coil Packages

A new reelless coil package, especially designed for handling bead wire used in the manufacture of automotive tires, has been developed by the National-Standard Co., Niles, Mich. The new coil package replaces the traditional method of shipping the wire on heavy reels and affords significant reductions in shipping costs, according to the manufacturer. This development offers wire to manufacturers in tightly-bound coils, spiral-wrapped in heavy paper and palletized for easy handling. The packaged wire is supplied in two coil sizes: two 1,000-pound coils or four 650-pound coils, interlocked with steel strapping on a wooden pallet. In addition to reducing tare weight substantially, the reelless coil eliminates empty reel returns, conserves storage space and facilitates rotation of inventory, as well as reducing unloading and in-plant handling. Specially engineered equipment — patents pending — simplifies handling the coils in the user's plant. This equipment consists of a point-of-use pneumatic let-off reel with detachable flange, a saddle block for assembling the reel and a pneumatic coil lifter to transfer the coil from horizontal to vertical position. The accompanying photograph shows an initial assembly step in which the let-off reel spider is inserted through the core of the coil.

Lee Super DeLuxe Truck Tire

Lee Rubber & Tire Corp., Conshohocken, Penna., has added the "Lee Super DeLuxe Highway Tubeless" to its line of truck tires. Lee Super-Tensile rayon cord is used in the carcass of the tire to provide extra protection against bruises and blowouts. Every cord is treated with Flexlok, a bonding agent which increases cord adhesion by 300%, the company claims. Cord-Guard, another Lee development, is also found in this tire. This is a rubber-coated mesh fabric which prevents air from reaching the cord ends in the bead area and seeping through the carcass. Lubri-Cushion construction, inserted between the plies of the new tire, lubricates plies, reduces internal friction and protects against bruise breaks by equalizing the flexing strain. The tire has a deep-cut tread design that puts more rubber in contact with the road. It is available in sizes and ply ratings ranging from 6.50-16 6 PR to 12.24-5 12 PR.

OTS Reports Available

Office of Technical Services, U. S. Department of Commerce, Washington, D. C., has made available two government research reports of interest to the rubber industry. The first one discusses the properties and applications of a new synthetic elastomer, Poly FBA, as analyzed by the Wright Air Development center. The new synthetic elastomer has a unique combination of fuel, oil and solvent resistance, and high temperature stability. The results of many tests suggest application in a variety of types of mechanical goods including seals, diaphragms, hose, coated fabrics and other items. Ask for report PB 111946 "Poly FBA—A Fluorinated Acrylic Elastomer for High Temperature Service in the Presence of Aircraft Fuels and Lubricants," 60 pages, $1.50. The second report describes work done by Cornell University on fluorine compounds under the Army's arctic rubber program. The purpose of the research was to investigate fundamental problems directed toward new methods of synthesis of potentially polymerizable fluorine-containing monomers. Work was done in three principal areas—radical addition reactions of perhalo olefins, condensation reactions of perhalo compounds and synthesis of fluorinated vinyl ethers. Ask for report PB 111959 "Basic Studies on the Chemistry of Fluorine Compounds," 148 pages, $3.75.

International Latex Promotes Two

International Latex Corp., Dover, Del., has announced the promotion of Arthur W. Dobberstein and H. Gordon Fromm to positions of greater responsibility. Mr. Dobberstein, for the past 10 years vice-president in charge of manufacturing at the main plant in Dover and all the company's branch factories in the United States, was promoted to vice-president, international manufacturing. Replacing Mr. Dobberstein as vice-president, manufacturing, is Mr. Fromm, who came to Dover about one year ago as works manager. Mr. Dobberstein's present position includes responsibility for coordination, review and appraisal, from a technical and broad policy standpoint, of manufacturing facilities, equipment, and methods, and for broad planning to meet future manufacturing needs.

Pittsburgh Coke Appoints Hall

Pittsburgh Coke and Chemical Co., Pittsburgh, Penna., has announced the appointment of James F. Hall, Jr., as company representative for industrial chemical sales in the Chicago area. Mr. Hall's office will be at 75 Wacker Drive, Chicago, Ill. Mr. Hall is a native of Pittsburgh, Penna., and a 1953 graduate of the University of Pittsburgh where he earned his degree in chemical engineering. Upon graduation, Mr. Hall joined Pittsburgh Coke as a sales trainee. For the past two years, he has been a Pittsburgh sales representative for the company's Plasticizer Division. Mr. Hall is a member of the American Institute of Chemical Engineers, the Society of Plastics Engineers, and the Society of the Plastics Industry, Inc.

Increasing Formaldehyde Output

Celanese Corp. of America, New York, N. Y., has announced that construction is under way on a major expansion of its Bishop, Texas, chemical plant designed to increase by 25% that plant's production of formaldehyde, methanol, acetaldehyde and certain other organic chemicals. R. W. KixMiller, Celanese vice-president and general manager of its Chemical Division, said the Bishop expansion program was made possible by an advance in fundamentaf technology perfected at the company's Clarkwood, Texas, laboratories. "The new facilities at Bishop are expected to come on stream early in 1957, enabling us to boost our production to 125% of today's capacity," Mr. KixMiller said. "This expansion program is designed to help meet American industry's ever-growing needs for organic chemicals and we are prepared to further increase our capacity to meet anticipated 1960 market potentials. "The volume of formaldehyde to be produced will make the Bishop plant the world's largest producer of this important industrial chemical, and the only plant using the unique Celanese direct oxidation process."

Firestone Racing Tires Available

Firestone Tire & Rubber Co., Akron, Ohio, has decided to make the Firestone "Super Sports 170" tire available for passenger cars. According to a recent announcement, the decision was prompted by requests from owners who desired the additional safety of race tire construction plus the four-way traction and long-wear characteristics built into the new tire. A complete range of sizes is being offered to fit the wheels of all modern passenger cars. The Super Sports tire has a nylon cord body, and the tread design combines maximum side and forward traction for safe operation on both wet and dry surfaces. The individual tread units of the new tire are held firmly together with tie bars which make the entire tread pattern operate as a single unit. The uniform wear on each traction block keeps the flat, non-skid tread intact throughout the life of the tire. Tread and sidewall compounds were developed from experience obtained on various speedways and extensive testing on sports cars.

Opens New Akron Office

A temporary rubber industry sales office for nylon, Dacron and rayon yarn has been opened by the Textile Fibers Department, E. I. du Pont de Nemours & Co., Inc., at 326 S. Main Street, Akron, Ohio. Permanent headquarters will be established in the Ohio Building in November. Howard P. Brokaw, formerly assistant manager of industrial sales, will head the new office which will assume nation-wide sales activities in the rubber industry previously conducted from Wilmington. Mr. Brokaw has been associated with the development, manufacture and sales of DuPont fibers and neoprene for 15 of his 17 years with the company. Since December, 1954, he has served as assistant sales manager for all DuPont fibers in industrial uses. A native of Wilmington, Mr. Brokaw received his master's degree in chemical engineering from Princeton University in 1939.

Lange Joins Columbian Carbon

Milton D. Lange

Milton D. Lange, formerly with the Armstrong Tire & Rubber Co., Natchez, Miss., has joined the Carbon Black and Pigment Division of the Columbian Carbon Co., New York, N.Y. He will have charge of the company's new sales office in Monroe, La., serving carbon black and pigment users in the southwest. Mr. Lange is a native of Pittsburgh and a graduate of the University of Pittsburgh with a bachelor's degree in chemical engineering. Prior to his position with Armstrong, he was connected with the Mellon Institute of Industrial Research and the B. F. Goodrich Co. Mr. Lange is a member of the Akron Rubber Group and the American Institute of Chemical Engineers.

U.S. Rubber Adds Debentures

Stockholders of the U.S. Rubber Co., New York, N.Y., at a special meeting recently, added convertible debentures to the types of securities which the company's board of directors may issue. Authorization was in the form of an amendment to the company's certificate of organization. The issuance of debentures convertible into common stock is one of several possible methods the company has been considering for raising $50,000,000 to $60,000,000 which may be needed for plant expansion and working capital, according to H. E. Humphreys, Jr., chairman. Mr. Humphreys announced that, if convertible debentures are issued, they will be offered pro rata to holders of the common stock, as provided by the General Corporation Act of New Jersey, under which the company is incorporated.

Colombia Honors Litchfield

P. W. Litchfield, chairman of the board of the Goodyear Tire & Rubber Co., Akron, Ohio, was honored at the opening of a new tire manufacturing plant in Colombia, when he received the Order of Industrial Merit from the South American republic. The honor was conferred by the president of Colombia, General Rojas Pinilla, in recognition of his progressive work and achievement in the field of industry. The new plant is located in Yumbo near the city of Cali and is now in full production on tires and tubes.

Santicizer 213 Plasticizer

A new primary plasticizer for polyvinyl chloride which greatly reduces the "tack" or gripping action of plastic surfaces has been developed by the Organic Chemicals Division of the Monsanto Chemical Co., St. Louis, Mo. Trademarked "Santicizer 213", the use of the product as a primary plasticizer in PVC formulations has reduced surface tack more than 70% in tests performed by Monsanto. In comparing equivalent formulations, DOP-plasticized PVC showed a coefficient of friction of 1.8 versus 0.5 for that employing the new plasticizer. The new compound, in addition to reducing tack, also imparts low initial viscosities to plastisols, improves fusion characteristics and gives added gloss to coated, molded and extruded products, Monsanto states. Coatings formulated with Santicizer 213 can improve performance of vinyl upholstery by minimizing the drag encountered in attempting to slide across such surfaces.

Chase Relocates Offices

To better coordinate production, sales and research facilities, Chase & Sons, Inc., have announced the relocation of their main offices from Randolph, Mass., to 26 Spruce Street, North Quincy, Mass. The following personnel changes and appointments have also been announced: Leonard P. Graham, former chief chemist, has been appointed sales manager of the Chase Cable Tape Division. He will be assisted by James Cochrane as technical representative. Robert C. Graham, formerly with Owens, Corning Fiberglas, has joined the firm as sales manager of the Chase Laminated and Reinforced Insulation Division. Edward E. Stritter, formerly with the Research and Development Department of the Boston Woven Hose & Rubber Co., has been appointed chief chemist.

Nash Purchases Dyken

J. M. Nash Co., Inc., Milwaukee, Wisc., manufacturers of special machinery for the plastic, textile and allied industries, has announced the purchase of the Dyken Manufacturing Co., West Bend, Wisc., producers of rolling machines. Operations at the West Bend plant will be continued as a wholly owned subsidiary, and the trade name "Dyken" will be retained. Charles P. Dyken, founder and former president, will remain with the organization as vice-president in charge of research and development.

Acquires Presstite Engineering

Stockholders of the Presstite Engineering Co. of St. Louis, Mo., have approved the sale of all of the company's assets and business to the American-Marietta Co., Chicago, Ill. The transaction involved the issuance of 90,000 shares of American-Marietta common stock with a current market value of about $4,500,000. Pressite Engineering produces joint sealing compounds and solvent cements. American-Marietta produces chemicals, paints and building materials.

Offers Polymer Chemistry Degree

The University of Akron has established its first doctor of philosophy degree leading to a doctorate in polymer chemistry, which involves the study of natural and synthetic rubber and plastics. The program, approved unanimously by the board, will start in September and will be the only one in Ohio offering a Ph.D. degree in this specialized field. In recommending the program, the committee cited five factors which makes the University of Akron qualified to offer graduate work in polymer chemistry: (1) the competence of the department of chemistry faculty; (2) opportunities for creative research under the direction of research chemists and physicists in the University's Institute of Rubber Research; (3) the scientific collection in the University's Bierce Library, which contains the library of the Rubber Division of the American Chemical Society; (4) modern equipment and facilities available in Knight Hall; and (5) the fact that Akron, as the world's rubber capital, attracts competent students seeking advanced study in polymer chemistry.

William S. Richardson, president of the B. F. Goodrich Co., Akron, Ohio, has made a personal gift of $30,000 to the University to establish a new fund to help support the new program. Other gifts were received from John L. Collyer, chairman of the board of Goodrich, the Charter Foundation of the Pyramid Rubber Co., Ravenna, Ohio, and friends for the Akron U Fund.

Dunlop-England Promotes Two

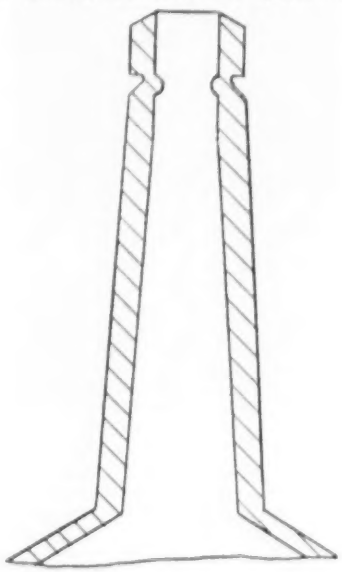
L. E. Masheter, formerly technical manager of tires for the Dunlop Rubber Co. at Fort Dunlop, Birmingham, England, and a member of the local board, has been appointed group technical manager, tires, concerned with technical policy and requirements of all tire factories. Mr. Masheter joined Dunlop Rubber after working as a technical official on the gutta percha plantation in Malaya of the Telegraph Construction and Maintenance Co. After several promotions and war duties in Toronto and Washington, D. C., he returned to Fort Dunlop in 1944 to become tire technical superintendent and, from 1946, acted as secretary to the local board until he became a member. Succeeding Mr. Masheter as tires technical manager is A. J. Hughes, formerly tires technical advisor. Mr. Hughes joined Fort Dunlop straight from school and has had varied experience in tire, belting, hose and tennis ball production.

Velsicol Advances Three

W. E. McCready, director of manufacturing for the Velsicol Chemical Corp., Chicago, Ill., has announced three promotions at the Marshall, Ill., plant. Wilson C. Keyes, formerly production superintendent, has been appointed to the newly created position of assistant plant manager. The new production superintendent is John Rex, who had been technical assistant to the plant manager. Robert Tiefel, who previously served as a development engineer, has been promoted to assistant superintendent of the reduction area.

New Alcoa Collapsible Tube

A "sticky" problem, that of preventing screw-type tubes from permanently resealing themselves once they've dispensed adhesives, dyes, or other hard-to-handle substances, is said to have been solved by the Aluminum Co. of America, Pittsburgh, Penna. The new development also eliminates the hazard of having unwanted amounts gush forth when the professional or do-it-yourself craftsman squeezes the tube. The tube is "dripless" in that a last drop will not mar the working area when the tube is momentarily set aside.



The extent of the depressed annular ring at the end of the tube is shown in this cross-sectional diagrammatic drawing.

Conventional aluminum collapsible tubes have a short extension on the nozzle end, sealed by a blind diaphragm. They are opened by turning a screw-eye until it punctures the seal. Alcoa's improved tube is an impact extrusion, as are many of the "squeeze" tubes used in millions of American homes. It features a longer nozzle, crimped around the circumference about ¼-inch below its open end. The "crimp," described technically as a depressed annular ring, acts as a seat for the pointed end of the screw eye. It also seals off the tube's content from the nozzle tip. Glue, cement, paste, dyes or similar material will pass the crimped area only when the tube is squeezed very firmly. One effect of the improvement is to eliminate the problem of reinserting the screw eye through beads of solidified "gook." At the same time, the longer nozzle and controlled flow of the tube's content permit the user to apply it only in desired amounts directly to the point of application. The combination adds up to a saving of material, time and temper, the company states.

The New York sales office of Goodrich Chemical is now located at 415 Madison Ave., New York 17, N. Y. The telephone number is TEmpleton 8-8600.

Named Research Director

Dr. J. William Zabor has been named director of research for Wyandotte Chemicals Corp., Wyandotte, Mich. He assumed his new post on June 11. The announcement was made by Frank B. Wolcott, vice-president and general manager of the firm's Research and Engineering Division. Dr. Zabor joined Wyandotte from the Pittsburgh Coke and Chemical Co. where for eleven years he successively held the positions of director of research, Activated Carbon Divisions; director of research and development for the company, and assistant to the vice-president, Chemicals Division. A native of Cleveland, Ohio, Dr. Zabor received his doctorate from the University of Rochester in 1940. He was an instructor in chemistry at Williams College and later served with the National Defense Research Committee. A scientific consultant for the U. S. Army with assignments in Australia and New Guinea during World War II, he received the Presidential Certificate of Merit for his outstanding work. Dr. Zabor is a member of the Board of Trustees at Hiram College and lists the American Chemical Society, the Association of Research Directors, the Industrial Research Institute and the Chemists' Club among the professional organizations to which he belongs.

Personnel Appointments at G-E

Silicone Products Department, General Electric Co., Waterford, N. Y., has announced four major appointments in the Engineering Section. Dr. Stuart D. Brewer, who formerly headed the analytical and control methods unit, has been made manager of resin product engineering. Dr. Frederick M. Lewis, who has been manager of the resin and rubber polymer unit in the Silicone Products Department, has been promoted to manager of advance development. Both Dr. Brewer and Dr. Lewis earned their Ph.D. degrees at New York University. Dr. Abbott Pozefsky, who joined the analytical and control methods unit in 1953, has been named its manager. Dr. Pozefsky studied at Carnegie Institute of Technology where he earned his doctorate in physical chemistry. Dr. William F. Gilliam, a research associate of the General Electric Research Laboratory since 1939, has been appointed a specialist in the technical information exchange. Dr. Gilliam received his Ph.D. in inorganic chemistry from Cornell University.

Receives Litchfield Award

Albert J. Gracia has been awarded the P. W. and Florence B. Litchfield Special Award of Merit for his leadership in putting the Atomic Energy Commission's billion-dollar Pike County gaseous diffusion plant into operation efficiently, on schedule and in accordance with exacting government demands. Mr. Gracia is only the twenty-seventh man to be honored with the gold medal award. As general manager of the subsidiary Goodyear Atomic Corp. from its beginning in 1952 to last January, he organized an operation entirely different from any other ever put into production by Goodyear, with a minimum of difficulty.

Technical Digests Available

The best articles from European technical and industrial journals, translated and digested, are now available monthly to American industry, John C. Green, director, Office of Technical Service, U. S. Department of Commerce, announced recently. The Organization for European Economic Cooperation, a multi-government agency set up to stimulate economic growth of member-nations, will distribute its monthly publication "Technical Digests" in the United States. It is designed primarily for those interested in manufacturing and production. Many of the articles in the periodical, which averages 140 illustrated pages, discuss new products and processes developed by European manufacturers. Designed for clear, concise, easy reading, the magazine contains digests of only the most effective articles gleaned by specialists from over 1,000 European periodicals. Subscriptions are handled by the O.E.E.C. Mission Publications Office, 2000 P Street, N. W., Washington 6. The rates are $24 a year or $2.50 per single issue.

Producing New Retread Items

The manufacture and sale of a newly developed curing bag and rim for the tire-retreading industry has been announced by the Mohawk Rubber Co., Akron, Ohio. The Akron firm has signed a licensing agreement with Robert Grossman of Allied Rubber Products, Inc., Detroit, Mich. The development is expected to greatly increase the service life of curing bags used in retreading "and thereby measurably reduce one of the most expensive factors of retreading," Mohawk said. Mohawk plans to merchandise and market the product throughout its tread rubber dealer and distributor system. Production is expected to get under way shortly. The new curing bag, invented by Arthur E. Richardson, is self-centering and thicker at points of greatest stress. It is in these areas where 90% of the failures occur in the present type of bags now in use, the company explained.

Names Four Vice-Presidents

Reichhold Chemicals, Inc., White Plains, N. Y., has named four of its executives to vice-presidencies. They are Dr. Fred A. Jolles, Herbert R. Helbig, George C. Sweet and Sam Gurley, Jr. Dr. Jolles, who is also a member of the board of directors, has been named vice-president in charge of the Foreign Division. Mr. Helbig has been made vice-president in charge of the Export Department and Mr. Sweet vice-president in charge of purchases. Mr. Gurley has become vice-president in charge of sales development.

Thiokol To Build Rocket Center

The construction of a $2,000,000 rocket and guided missile research and development center near Morinne, Utah, has been announced by the Thiokol Chemical Corp., Trenton, N. J. Company officials said the plant will employ up to 500 persons when completed. The starting time on the project is indefinite.

Chase Appoints Chief Chemist

Edward E. Stritter

Edward E. Stritter, formerly with the Boston Woven Hose & Rubber Co., Cambridge, Mass., has been appointed chief chemist of Chase & Sons, Inc., Randolph, Mass. A graduate of Massachusetts Institute of Technology, Mr. Stritter has many years of experience in compounding and processing of natural and synthetic rubbers and of plastics. While with the Boston Woven Hose & Rubber Co., Mr. Stritter was technical director of the Plastics Division for five years and spent the last two years as chief compounder for hose and belting.

Enlarging Flooring Facilities

A major expansion in floor-covering production facilities at Jeannette, Penna., has been announced by the General Tire & Rubber Co. The new project will double the manufacturing capacity of the six-month-old Flooring Division. Mr. Powers, vice-president of plastics, said new installations of equipment and machinery will turn out "Terrazzo" vinyl tile, a companion to General's plain and marbleized Boltaflor announced last fall. The latter was offered initially in 22 plain and marbleized colors. Terrazzo adheres to the original idea of floor styling with chips of color standing out in an authentic imitation of the vari-colored stones of the "old world" design, Mr. Powers added.

To Construct English Plant

The board of directors of the new International Synthetic Rubber Co. have awarded a contract to the Chemical Plants Division, Blaw-Knox Co., Pittsburgh, Penna., for the design and construction of the first synthetic rubber plant in Great Britain. The new facility will have a capacity of 50,000 long tons of GR-S type rubber per year. It is proposed to locate the new plant at Fawley, England, adjacent to the petroleum refinery of the Esso Standard Oil Co., who will supply the butadiene. Design work started in June, and it is estimated that approximately two years will be required to complete the $12,000,000 project.

BRP Rubber Reinforcing Resins

British Resin Products Ltd., London, England, has announced the availability of "Cellobond Rubber Reinforcing Resins," resin reinforcing agents for natural and nitrile rubbers. The new reinforcing agents facilitate the use of natural and synthetic rubbers over a wide field of applications and provide the rubber industry with a new aid in meeting the technical needs of modern industry, according to BRP. Cellobond Rubber Reinforcing Resins are readily dispersible with natural and nitrile rubbers at all loadings. In nitrile rubbers particularly, and especially in harder stocks, they function both as reinforcing agents and as processing aids. These resins reinforce hardness according to the amounts employed to give products ranging from soft vulcanizates to hard ebonite-like materials. They are particularly useful in the production of technical moldings in the 90° hardness range which otherwise are produced only with difficulty.

Baird Anti-Static Agent

Baird Chemical Corp., New York, N. Y., has announced a new compounding material for vinyls which is said to render the product virtually free of static electric charges. "Antistat A", as the new product is known, is most suitable for flexible vinyls. It is a compatible, conductive light amber liquid which is easily incorporated into the resin without noticeable effects on the properties of the vinyl. It is free from amine groups and is stable at the usual processing temperatures. Its odor is negligible and it may be used in clear, colorless films as well as in any colored films. It is suitable for plasticized compositions, but not for rigid PVC, Baird states. Antistat A does not affect the printing properties of the vinyl nor does it have any effect on subsequent heat sealing operations.

To Furnish Technical Data

Connecticut Hard Rubber Co., New Haven, Conn., has announced the signing of a ten year royalty agreement to furnish Precision Rubbers, Ltd., Bagworth, England, with technical information on the production of specialized silicone rubber and fluorocarbon plastic for aircraft parts. The agreement with the English firm makes possible for the first time the production abroad of high strength silicone rubbers, "Colorlastic HT," developed by Connecticut Hard Rubber. The British firm's initial production will be for the British air fleet and the air forces of other NATO units.

Describes Avisco Projects

Dr. Herschel H. Cudd, vice-president of the American Viscose Corp., Philadelphia, Penna., reports that the company is now in commercial production on a new, super-strength tire yarn. Dr. Cudd also revealed that a new fibrous rubber product is about ready for semi-commercial production. He stated that the greatest end use developed to date for this product is as a rug underlay. Other end uses for this porous, non-skid, tear-resistant material are being explored.

Named Assistant Sales Director

Dr. Charles J. Harrington, assistant sales manager for isocyanates of the Elastomers Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has been named assistant director of sales of that division. A graduate of Princeton University in 1933, Dr. Harrington joined the company as a chemist in the Jackson Laboratory of the Organic Chemicals Department, Deepwater Point, N. J. After a year, he left to take his postgraduate studies at the Massachusetts Institute of Technology but returned in 1937. He received his Ph.D. degree in chemical engineering from M. I. T. the following year. In 1940, he was transferred to the Industrial Engineering Division, Engineering Department, and the following year joined the staff of the neoprene works then in the process of organization at the Chambers Works. He went to the neoprene plant at Louisville, Ky., as an area supervisor in 1942.

Dr. Harrington was transferred to the Hanford Works, the World War II plutonium plant, as a supervisor of production and later was made an area supervisor there. In 1944, he was made assistant chief supervisor and, in 1945, was advanced to chief supervisor there. Later the same year, he returned to the Louisville plant as superintendent of the Service Division. In January, 1948, Dr. Harrington was transferred to the European office of the Foreign Relations Department as technical representative and was made manager of the office in July, 1948. He was appointed an assistant secretary of the company and assistant director of the secretary's department in 1952, at which time he returned to Wilmington. In 1954, Dr. Harrington became assistant manager of the newly formed sales organization for isocyanates.

Boards Approve Merger Plan

West End Chemical Co., Oakland, Calif., and Stauffer Chemical Co., New York, N. Y., have announced that their boards have approved a plan to merge West End into Stauffer. It is expected that the formal merger agreement will be adopted by both boards in the near future and will be submitted to the stockholders of both companies for approval. The plan provides for an exchange of one share of Stauffer common stock for 5.6 shares of West End common stock and one share of Stauffer common stock for 60 shares of West End preferred stock, excluding the shares of both classes of West End which are owned by Stauffer. West End will continue to operate as an autonomous division of Stauffer under the designation of "West End Chemical Company Division, Stauffer Chemical Company."

Jones Assumes Pioneer Post

John R. Jones, for 27 years with the B. F. Goodrich Co., Akron, Ohio, has been appointed sales manager of the Pioneer Rubber Co., Willard, Ohio. Mr. Jones was formerly field sales manager of the Sundries Division of Goodrich. Pioneer Rubber manufacturers rubber gloves for home, surgical and industrial uses, and baby pants, balloons and other items.

LABOR NOTES

Agreement on a 6.2c per hour wage increase has been reached by negotiators for the United Rubber Workers, AFL-CIO and the "Big Five." The companies also agreed to accept the principle of supplementary unemployment benefits. First to sign was the B. F. Goodrich Co. on July 14. Goodyear Tire & Rubber Co. and the union signed on July 17 and the agreement with U. S. Rubber was signed on July 20. The Firestone Tire & Rubber Co. contract was signed on July 21, and General Tire & Rubber Co. signed five days later. At this writing, the Seiberling Rubber Co. is still negotiating, but settlement is expected along the lines set by the other companies.

The agreement signed by Goodrich, and eventually by the others, was the first in which a layoff pay plan is a feature. Although the union had indicated for the past year or so that it aimed to seek such a plan, the Goodrich agreement came as something of a surprise. Under the terms of the contract, the company agreed to contribute 3c an hour to a supplemental unemployment benefit plan. Specific details of the plan were, in most cases, to be worked out later. It is expected that in other cases where contracts are now being negotiatd or where contract talks are pending, settlements will, in general, follow the same basic pattern.

Hall Opens Memphis Office

C. P. Hall Co. of Illinois has announced the opening of a new office and warehouse located at the Paterson Transfer Co. building, 648 Riverside Drive, Memphis, Tenn. The telephone number is Jackson 5-0985. Roger Pfau, who has serviced this area for the last six years, will be manager of the operation. Lenoir Black, a technical representative for the company and presently located in Natchez, Miss., will be under the direction of the Memphis office. The company also announced that warehouse stocks will be carried to better service industry in this general area.

Named Assistant to President

George M. Dever has been appointed as assistant to the president of the Robert M. Fredericks Corp., Woodside, N. Y. He joins Fredericks with a wide background in business administration as former assistant to Charles E. Wilson who was president of General Electric Co. and recent chairman of the board of W. R. Grace & Co. Mr. Dever will assume general sales and promotion responsibilities and will act in an advisory capacity with the Federal Rubber Manufacturing Corp., a division of Fredricks.

Two New Polyethylene Resins

The Polychemicals Department of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has announced the availability of two new polyethylene resins. According to the company, the materials "display a level of crystallinity well beyond that available in any present commercial resin." One resin is intended for films and bottles and the other is for general purpose molding.

New Cold Rubber Initiator

A product which shows considerable promise as an initiator in the manufacture of "cold rubber" can be produced from gum turpentine under a process patented recently by two United States Department of Agriculture scientists. The product and method of preparation are described in U. S. Patent No. 2,735,870, "Peroxides of Saturated Cyclic Terpenes and Method of Producing Same" granted to Gordon S. Fisher and Leo A. Goldblatt, of the Southern Utilization Research Branch of the Agricultural Research Service, USDA, and assigned by them to the Secretary of Agriculture for the public use. This invention may be used without payment of royalty. A copy of the patent may be purchased for 25 cents from the U. S. Patent Office, Washington, D. C.

Tests by commercial concerns, as well as government agencies, indicate that these chemicals, called terpene hydroperoxides, are excellent catalysts for 5°C. GR-S rubber polymerization, and there has also been some interest in their use in the manufacture of plastics. These terpene hydroperoxides, or pinane hydroperoxide, can be made from gum turpentine, alpha-pinene, or beta-pinene. Yields are good, running as high as 60% in a seven-hour period, and the technical grade can be obtained in purities up to 90%.

To Build Giant Conveyor System

Hewitt-Robins, Inc., Stamford, Conn., has undertaken to construct a giant conveyor system that will generate its own electrical power and set new speed records for materials handling. The conveyor system will be nearly two miles long and will handle gravel at an average rate of 75,000 tons a day. When operating at full capacity, the rate can be increased to 90,000 tons, working three shifts totaling 21½ hours. The speed of the belts will be 800 feet a minute, exceeding usual belt speeds by 300 to 400 feet a minute. A patented drive mechanism, invented by Hewitt-Robins engineers, will be used to start the conveyor and control its speed. Once the conveyor system starts rolling, it will require little or no power from outside sources. The belting will be produced at the Hewitt Rubber Division in Buffalo, N. Y., and the machinery at the Robins Conveyor Division in Passaic, N. J., and the Jones Machinery Division in Chicago, Ill.

Goodrich Philippine Personnel

John Robert Dietrich has been named factory manager of the B. F. Goodrich Co. plant near Manila in the Philippine Islands. Mr. Dietrich, who attended the University of Akron, started at Goodrich 20 years ago as a messenger. He later became an order editor and scheduler before serving four years in the Army during World War II. Since 1946, he has been a floor foreman, a shift superintendent and a general foreman in the Akron tire plant. Also assigned to the new plant are Vincent B. Gay, who has been named technical advisor on tire construction, and R. K. Liese, who has been appointed technical advisor on tire compounding.

Goodyear Advances Drew

Philip W. Drew

Philip W. Drew, formerly manager of fabric development for the Goodyear Tire & Rubber Co., Akron, Ohio, has been placed in charge of all development phases dealing with the company's new "Captive-Air Safety Tire." In his special assignment, Mr. Drew will oversee all future advancements pertaining to the new tire. Mr. Drew joined the Goodyear organization in 1925 in a production capacity at the Los Angeles plant. In 25 years with the West coast plant, he rose to the position of technical superintendent. Mr. Drew was transferred to the Akron Tire Development Division in 1950, and his appointment to head of fabric development followed in 1953. While in this capacity, he directed the development of Goodyear's 3-T method of processing cord to produce tire fabric. A native of Salem, Ore., he was graduated from Knox College in 1925 with a B.S. degree in chemistry.

Constructing Aniline Plant

The Organic Chemical Division of the American Cyanamid Co., New York, N. Y., has announced plans to construct a plant to produce aniline by a catalytic process at the site of the company's Willow Island, West Va., plant. The plant will have a rated annual capacity of 24,000 pounds. Design work has been completed, and completion of construction is scheduled for the fall of 1957. Decision to build at Willow Island was made because the rubber industry in Ohio and the surrounding area provides a substantial outlet for aniline. The new plant will use for the first time a fluid bed reactor and new catalyst in the manufacture of aniline from nitrobenzene by the reduction process.

DuPont Lab Receives Awards

The Akron, Ohio, laboratory of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has received two national safety awards for 1955. Both the National Safety Council's chemical section award and the Manufacturing Chemists' Association "Certificate of Achievement" have been presented to the local unit. They were awarded for a perfect safety record in 1955 and for the completion of more than 72,000 man-hours without a lost-time accident.

Producing New Styrene Rubbers

Two new styrene rubbers, Plioflex 1773 and 1778, and an improvement of Plioflex 1006 have been announced by the Rubber and Rubber Chemicals Department, Chemical Division, Goodyear Tire and Rubber Co., Akron, Ohio. Plioflex 1773 is a cold oil masterbatch containing 25 parts naphthenic oil. Plioflex 1778 is also a cold oil masterbatch with 37.5 parts naphthenic oil. Both are protected during manufacture with non-staining, non-discoloring stabilizers. These new products combine the toughness and general physical characteristics of previous oil masterbatches with greater uniformity, better processing and improved color, the company states. The new Plioflex 1006 is an improved hot non-extended styrene rubber. Improved production techniques have resulted in a lighter colored polymer. The rubber processes easily and permits more exacting color work in the manufacture of light colored rubber products. All three elastomers have non-staining, non-discoloring properties.

Firestone 13-Inch Tires

Firestone Tire & Rubber Co., Akron, Ohio, now has tires available for use on 13-inch rims. They are being made for owners of foreign cars with smaller diameter wheels than those on American automobiles. These tires, made in tubed construction, can be purchased with either black or white sidewalls. Sizes available are 5.20 x 13, 5.90 x 13 and 6.40 x 13. Firestone dealers also have tires for foreign cars in 5.60 x 15 and 5.90 x 15 sizes. The 13-inch tires are even smaller in diameter than 14-inch tires which will be used as original equipment on several makes of 1957 cars. American cars now use tires in 15-inch diameter.

New Parker Seal Compound

A new synthetic rubber compound developed for high temperature fuel service by the Rubber Research & Development Laboratory of the Parker Appliance Co., Cleveland, Ohio, has been found to be suited for soft seat sealing applications. Parker Appliance is furnishing the new material in special molded shapes and bonded parts, fabricated to customer specifications, as well as in standard O-ring seals. Designated as Parker compound "36-551," the material features no shrinkage after dry-out, low volumetric swelling, and excellent low temperature characteristics, remaining flexible at —75°F., it is said.

National Starch Elects Two

The election of Donald D. Pascal as executive vice-president, succeeding the late A. A. Halden, and William C. Buffing as treasurer of National Starch Products Inc., 270 Madison Avenue, New York, N. Y., has been announced by Frank Greenwall, president. Mr. Pascal, a graduate of Brooklyn Polytechnic Institute with a B.S. in chemistry, has served in many managerial capacities within the company since he joined the organization in 1929. Mr. Buffing, formerly controller of the company, is a graduate of New York University, School of Accounting and Finance.

Hensal Named Vice-President

Earl A. Hensal

Earl A. Hensal, factory superintendent of the B. F. Goodrich Co. tire and equipment plant in Akron since 1954, has been named production vice-president of the Seiberling Rubber Co., Akron, Ohio. In his new position at Seiberling, Mr. Hensal will have charge of production, engineering, development and purchasing operations. He succeeds Harry P. Schrank, who was elected executive vice-president in May. From 1950 to 1954, Mr. Hensal was production superintendent at the Goodrich Akron tire plant. Before that, he served as superintendent of tire operations at the Canadian plant and as general foreman of tires and stock preparation for the Los Angeles plant. He was also manager of time study and industrial engineering at the Goodrich plant in Oaks, Penna. A native of Portage, Penna., Mr. Hensal has lived in Akron since 1919. He attended the University of Akron.

Pyrolux Organic Color Pigment

An organic color pigment, "Pyrolux Maroon D-3148," with resistance to discoloration due to heat, has been developed by the Sherwin-Williams Co., Chicago, Ill. This new pigment, said to have excellent permanence, is a brilliant non-bleeding, easily dispersed pigment. It should be of interest to the rubber, plastics, and printing ink industries for use in any material where high heat and light resistance are major requirements. The manufacturers especially recommend it for use in vinyl chloride resins, vinyl copolymers, polystyrene, and polyethylene, where heat resistance is of prime importance and light resistance is often desired.

Gross Marketing New Oleic

A new oleic acid which is a low linoleic white oleine has been introduced by A. Gross & Co., New York, N. Y., according to Eugene W. Adams, vice-president. The new product, "Groco 5L," is a premium oleic acid of extremely light color and low linoleic acid content, which gives it stability and resistance to oxidation. According to Mr. Adams, recent production has resulted in oleic acids with a linoleic content well under the established maximum of 5%. The oil has a low titre under 5°C. and an iodine value of 86 maximum.

Names in the News

C. W. Bentley has been appointed a vice-president of Colt's Plastics Co., Inc., a subsidiary of the Penn-Texas Corp. Mr. Bentley will continue to serve as works manager of the company.

John L. Gillis, vice-president of the Monsanto Chemical Co., has been elected chairman of the board of the Manufacturing Chemists' Association.

Richard C. Burck, formerly a development engineer for the Molray Chemical Co., has been promoted to the position of product development supervisor.

Edward C. Sauter, manager of cycle tire sales for the Goodyear Tire & Rubber Co., was recently honored by the company on his completion of 35 years' service.

Evart W. Wright, associated with the B. F. Goodrich Co. since 1938, has been named manager of molded and extruded products for the B. F. Goodrich Industrial Products Co.

Louis W. Cabot, vice-president and treasurer of Godfrey L. Cabot, Inc., has been appointed to the advisory board of the Colonial Fund, Inc., Boston, Mass.

John A. Jackson has been appointed sales manager-plastics of Stokes Molded Products, a division of the Electric Storage Battery Co. He was formerly assistant sales manager.

Lawrence L. Garber, associated with the H. K. Porter Co. since 1950, has been named to the newly-created position of vice-president in charge of production.

Harold Reuben, formerly associated with the Lee Tire & Rubber Co., has been appointed chief chemist of Ace Rubber Products, Inc.

John P. Cartwright, associated with the Joy Manufacturing Co. since 1950, has been named sales manager, industrial sales.

H. E. Cook, chief engineer at the B. F. Goodrich Co. since 1929, retired recently after 45 years of service.

Henning W. Prentis, Jr., chairman of the board, Armstrong Cork Co., Lancaster, Penna., has been selected to receive the 1956 Henry Laurence Gantt Gold Medal for "distinguished achievement in industrial management as a service to the community."

Carl Fuller, previously a buyer for engineering purchases for the General Tire & Rubber Co., Akron, has been named purchasing agent for the Textileather Division in Toledo.

William A. W. Krebs, Jr., a member of the Massachusetts and New York Bars, has been elected vice-president of Arthur D. Little, Inc., Cambridge, Mass.

Jim J. Orr, formerly manager of plant engineering in the Central Engineering Department of the U. S. Rubber Co., New York, N. Y., has been appointed assistant director of engineering.

Dr. John L. Miller, head of the Defense Research Division of the Firestone Tire & Rubber Co., Akron, Ohio, since its inception in 1950, has been named director of defense activities, succeeding William D. Gohr.

Samuel Salem, previously manager of textile and adhesive development for the General Tire & Rubber Co., Akron, Ohio, has been appointed manufacturing analyst.

Dr. Donald McIntyre, a physical chemist, has joined the staff of the National Bureau of Standards.

Dr. William L. Evers, formerly a staff member of the Central Development Department of the Celanese Corporation of America, New York, N. Y., has been appointed assistant manager of fiber research.

William D. Zahrt, assistant treasurer of the Firestone Tire & Rubber Co., Akron, Ohio, since 1929, has retired after 38 years with the company.

E. D. Lutz, of flooring sales, has been promoted to manager, flooring distribution sales for the Films and Flooring Division of the Goodyear Tire & Rubber Co., Akron, Ohio.

Herman Epstein, co-founder and executive of the Columbia Cement Co., Inc., Brooklyn, N. Y., has been honored at a dinner given him by the Artists' Materials Division of the United Jewish Appeal of Greater New York.

James J. Lowe, formerly sales manager of the American Manufacturing Co., Brooklyn, N. Y., has joined the Peters Manufacturing Co., Wollaston, Mass., as general sales manager.

Edward V. K. Jaycox and Raymond P. Abouchar, former members of the Marketing Research Department, have been appointed to the Advance Planning Department of the Firestone Tire & Rubber Co., Akron, Ohio.

William J. Sparks, director of the Chemicals Research Division of the Esso Research & Engineering Co., Bloomington, Ind., has received the Distinguished Alumni Service Award, the highest alumni award, of Indiana University.

Raymond L. McCurdy has been assigned as special sales representative to the Cleveland district of the Chemical Division, Goodyear Tire & Rubber Co., Akron, Ohio.

David Rockefeller, executive vice-president of the Chase Manhattan Bank, has been elected to the board of directors of the B. F. Goodrich Co., Akron, Ohio.

Bradley Dewey, president and founder of the Bradley Container Corp., Maynard, Mass., and a past president of ACS (1946), has retired from administrative duties with the company. He has been appointed as a consultant to top management and a special representative for Olin Mathieson Chemical.

Thomas Barker, formerly in charge of the Midsouth Division, American Mineral Spirits Co., Chicago, Ill., has been appointed manager of special products sales for the company.

Arthur B. Bush and Richard A. Lord have been appointed to new assignments in the Sundries Department, B. F. Goodrich Industrial Products Co., Akron, Ohio. Mr. Bush, manager of sales training since 1955, has been made manager of the department, and Mr. Lord, formerly sales representative in the Philadelphia territory, has been appointed field sales supervisor.

Walter M. Rauscher has been promoted to the position of buyer, engineering purchases of the General Tire & Rubber Co., Akron, Ohio.

Herman K. Hochschwender, formerly manager of production planning for the Firestone Tire & Rubber Co., Akron, has been appointed president of the Mohawk Rubber Co. of New York.

Lewis J. Pentland, Evan E. Graham and Henry B. Puff have been named district sales managers of the Durez Plastics Division, Hooker Electrochemical Co., Niagara Falls, N. Y., for New York, California and Chicago, respectively.

Donald Leever has rejoined Reichhold Chemicals, Inc., after three years' absence to become division director of technical service in St. Louis, Mo., St. Paul, Minn., Kansas City, Mo., Denver, Colo., Houston and Dallas, Tex.

Charles M. Scholz has been appointed vice-president of friction materials and industrial rubber products for the Thermoid Co., Trenton, N. J.

J. M. Linforth, vice-president in charge of manufacturers', government and aviation products sales for the Goodyear Tire & Rubber Co., Akron, Ohio, has retired after 33 years with the company.

Dr. A. Eugene Schubert, formerly manager of engineering for the Chemical Materials Department, General Electric Co., Pittsfield, Mass., has been named manager of the Chemical Development Department.

New Safety Record Established

A new, all-time safety record was established by the chemical industry in 1955, according to the Manufacturing Chemists' Association, Washington, D. C. Lost-time accidents in the industry, as recorded by MCA, amounted to 3.25 per million man-hours worked, the lowest accident frequency figure in the history of the industry and a slight improvement over the previous record of 3.27 established in 1954. S. M. MacCutcheon of the Dow Chemical Co., chairman of MCA's General Safety Committee, pointed out: "The chemical industry accident rate is now almost one-fourth of the 12.10 (per million man-hours worked) figure reported by the Bureau of Labor Statistics for all manufacturing during the first nine months of 1955. We continue to be one of the safest industries in the country." The association announced also that to date it had awarded 331 certificates of safety achievement for 1955 to plants representing 32 companies.

Finish for Vinyl Plastisols

A new finish for vinyl plastisols designated as "N-230" has been announced by Logo, Inc., Chicago, Ill. The new finish is reported to have good adhesion to a wide variety of plastisol formulas on which it has been evaluated. It is also said to provide excellent flexibility and extensibility along with good aging qualities. This finish is further reported not to be adversely affected by migration of plasticizers from plastisol formulations checked to date. Non-lead bearing pigments are available in this finish for toy and related applications on request to the company. Because of the many variations in available plastisol formulations, the manufacturer recommends samples of the cured plastisol be submitted along with requests for samples of the finish. Requests for samples and further information should be directed to the company at 12933 South Stony Island Ave., Chicago 33.

FMC Producing New Catalyst

Westvaco Mineral Products Division of the Food Machinery and Chemical Corp., New York, N.Y., has announced the quantity production of "1707 Catalyst" at the Newark, Calif., plant. The new catalyst, used in the manufacture of butadiene and styrene, is a metal oxide type of dehydrogenation catalyst containing a high proportion of magnesia. The Newark, Calif., plant is geared to continuous large-scale manufacture of magnesium oxides in a wide range of specifications for general industry use.

Williams Appointed Manager

A. Eugene Williams has been named manager of the Rubber Hose and Extruded Goods Division of the Swan Rubber Co., Bucyrus, Ohio. Mr. Williams joined Swan Rubber in 1954 after being associated with the Industrial Products Division of the B. F. Goodrich Co. for 8½ years in various technical assignments, the last of which was technical manager of the Hose Department. He graduated from Purdue University Chemical Engineering School in 1942.

Wilmod Rubber Division Formed

John Williams

The Plastics Division of the Wilmod Co., Toronto, Ont., Canada, has announced the formation of the Wilmod Rubber Division. The new division will be operating both in Canada and the United States and will carry a full range of light, medium and heavy rubber and plastics equipment. This equipment will be supplied by Iddon Brothers, Ltd., Leyland, Lancashire, England. John Williams, formerly technical sales engineer with Francis Shaw (Canada) Ltd., and of Francis Shaw & Co., Ltd., England, will head the new division as technical sales and service manager. Mr. Williams is a member of the Society of Plastics Engineers, and he has been in the rubber and plastics industry for the past 12 years on installation, design and consultant work in the United Kingdom, Europe, Canada and the U. S.

Interesting Rubber Articles

Two articles of particular interest to the rubber industry appear in the current issue of "Rubber Developments," quarterly publication of the Natural Rubber Bureau, Washington, D.C. The first of these articles concerns itself with recent developments in "Heveaplus," the polymethylmethacrylate modified natural rubber. In the two years since the introduction of this rubber advance, new strides have been taken. The article describes a new technical graft polymer that contains up to 50% polymethyl-methacrylate, i.e., equal parts of rubber and polymer. The second article discusses the use of rubber rail pads throughout the world. It is reported that these pads are finding increasing use.

Liberian Export Company Formed

The U.S. Department of Commerce has announced that a new firm, the United Liberian Rubber Co., has been formed in Liberia to purchase rubber from independent Liberian producers for export to Germany. The firm is controlled by two Hamburg firms: Gebr Muller and Nordman, and Russmann and Co. The local manager estimates he will be able to purchase about 100 tons a month. He plans to construct a washing and drying plant in the Monrovia area, since the rubber that is now purchased needs treatment before it can be exported.

Sherwin-Williams Red Toners

Two new azo red toners of a type never before available have been added to the line of colors for the rubber industry available from the Pigment, Color and Chemical Division of the Sherwin-Williams Co., Chicago, Ill. The "Arcturus Reds," as they are named, are brilliant yellow-red shades produced in resinated and non-resinated forms. The resinated, "Arcturus Red CP 1275," exhibits the usual differences from the non-resinated color, "Arcturus Red CP 1270," being slightly brighter, yellower and darker. Tests indicate the new pigments are well suited for use in rubber, vinyl plastics, and polystyrene. They show very good heat stability during the cure of rubber; they exhibit no migration and slight bleeding in soap solution. Since the heat stability of the Arcturus Reds is exceptional, they are very suitable for use in plastics; neither color displays any crocking, the company states.

Plans New Research Center

A new center for consumer products research and development will be established by Hewitt-Robins, Inc., according to an announcement by Ellis B. Gardner, vice-president. The facilities for this purpose are being erected in connection with the company's building expansion program at Franklin, N. J., which includes a manufacturing plant for the production of urethane foam. The research at Franklin will be in addition to Hewitt-Robins' regular laboratory control and development work at its plants in Fremont, Ohio, Buffalo, N. Y., and Staten Island, N. Y. Investigations will be conducted on molded foam rubber and slab foam, foam with fabric backing, plastic foam, seating problems and applications for the automotive and furniture industries, carpet cushioning and rubber and vinyl floor tile.

Cleveland Belt Line Proposed

A plan to build a rubber conveyor belt subway under Euclid Avenue in Cleveland, Ohio, has been submitted by Passenger Belt Conveyors, Inc., Akron, Ohio, which is jointly owned by Goodyear Tire & Rubber Co., Akron, Ohio, and the Stephens-Adamson Manufacturing Co. of Aurora, Ill. The proposal is being studied by Albert S. Porter, Cuyahoga County engineer. Mr. Porter said the plan warrents his consideration even though the city now is inclined toward building a rapid transit rail subway station downtown. Passenger Belt Conveyors says its system can be installed in downtown Cleveland for $32,525,000, well within the $35,000,000 allotted for the subway.

Sheehy Joins Glyco Products

John P. Sheehy has joined the technical service and sales staff of the Glyco Products Co., Inc., New York, N. Y. Mr. Sheehy received his M.S. degree in chemistry from Fordham University. He was previously engaged in product research and development and market research for the Solvay Process Division.

American Expands Felt Division

American Felt Co., Glenville, Conn., has announced the expansion of its Felt Specialties Division and the appointment of E. P. Wenzelberger, a research specialist in rubber and plastic products, as supervisor of the division. American Felt's program in production and research is to develop new commercial applications for coated, laminated and impregnated felts. Mr. Wenzelberger will make his headquarters at the Newburgh, N. Y. plant of the company. Experienced in general development and production engineering, he will concentrate largely on the application of natural and synthetic latices and elastomers to felt as well as the application of powdered and liquid resins to fibrous constructions of all types. Mr. Wenzelberger has been associated with Johnson & Johnson at New Brunswick, N. J., the Commonwealth Engineering Co. of Dayton, Ohio, and most recently with the U. S. Rubber Co. He holds many patents for pressure sensitive adhesives and was active in the development of Masslin, a nonwoven cotton fabric bonded by plastics. The production of felt specialties incorporating resins and latices is part of a continuing development program at American Felt's Newburgh plant.

Highway 110 Truck Tire

Seiberling Rubber Co., Akron, Ohio, is now producing its "Highway 110" truck tire in both the tubeless and conventional versions. The tubeless Highway 110 is a drop center type truck tire with rayon body construction. Both the tubeless and conventional versions feature Seiberling's patented heat vents which give the tire cooler running performance. Described as an "all-purpose" truck tire, the Highway 110 has a larger 'foot print", or tread area, than ordinary tires of this type. This means longer wear, according to a company official. Tread grooves on the tire are rounded at the bottom and nearly perpendicular at the sides to provide against possible tread cracking. The bottoms of the grooves are also reinforced with extra rubber. The tubeless Highway 110 is available in sizes 6.00-16 through 11-24.5.

Tubeless Tax Increase Dropped

The House Ways and Means Committee has reversed itself and rejected a proposed tax increase of 1 cent a pound on tubeless tires. The additional levy, tentatively approved by the committee a few weeks ago, would have raised an estimated $6,600,000 annually in excise tax revenue. The action was taken as the committee resumed work on revision in excise taxes proposed by a subcommittee. Motorists and truckers still face the prospect of a sharp increase in taxes on all tires this year to help pay for a highway-building program. Under legislation that already has cleared both the Senate and House, the present tax would be raised to 8 cents a pound for all tires. A conference committee has been assigned to reconcile differences between the two measures.

Two New Polyethylene Plants

Construction of two new plants for the production of low-pressure polyethylene has been announced by the Union Carbide and Carbon Corp., New York, N. Y. The two plants, located at Institute, West Va., and Seadrift, Texas, with a combined rated annual capacity of 55,000,000 pounds, are scheduled for completion next year. The new facilities will be equipped to produce polyethylene by a number of new techniques, using not only the Ziegler and Phillips low-pressure processes, for both of which Union Carbide has been licensed, but also incorporating advanced technological improvements for olefin polymerization developed in Union Carbide's own laboratories and pilot plants. The unit at Institute is scheduled for completion in the first quarter of 1957. The second unit at Seadrift will be in production just a few months later. These new facilities are being built and will be operated by the Carbide and Carbon Chemicals Co. and sales will be handled through the Bakelite Co.

Silicone Rubber Sponge

What are said to be the first silicone rubber compounds to be engineered specifically for sponge applications have been developed by the Silicone Products Department, General Electric Co., Waterford, N. Y. Believed to be significant contributions to the technology of sponging silicone rubber, these compounds permit simplified fabrication methods, produce closed cell sponge, boast longer fresh life and offer batch-to-batch uniformity. These sponge rubbers can be used at temperatures ranging from minus 100°F. and below to 400°F. and above, in contrast to non-silicone rubbers which become hard and brittle at low temperatures and soft and gummy at elevated ones. These developmental compounds can be expanded with any of the blowing agents suggested for silicone rubbers and can be mold-expanded or extruded for free expansion, the company states.

Delayed Action Accelerator

The Rubber Chemicals Department of the American Cyanamid Co., New York, N. Y., has announced pilot plant production of a new delayed action accelerator. Called "Dibs Accelerator," it will be of special interest to tire manufacturers and others who encounter severe scorching problems in processing. Dibs is an addition to Cyanamid's present line of delayed action accelerators, "Nobs Special" and "Nobs No. 1." This newest rubber processing chemical was specifically developed to encounter the high processing temperatures built up during the mixing and extruding of super abrasion furnace black stocks. The small particle size of these carbon blacks imparts extreme abrasion resistance and makes them valuable in longer wearing tire treads, industrial belts, tank-blocks and other mechanical goods where resistance to severe service is important. Dibs Accelerator is N,N-diisopropyl benzothiazole-2-sulfenamide. Its melting range of 131 to 139°F. permits easy incorporation into furnace black stocks, the company states. Dibs has good storage stability under normal temperature conditions.

General Tire Appoints Four

Chemical Division of the General Tire & Rubber Co., Akron, Ohio, has announced four appointments at the Mogadore, Ohio, plant. Robert W. Laundrie, recently chief process engineer at the University of Akron Government Laboratories, has been appointed chief process chemist in charge of process engineering. Louis E. Gressingh, formerly with the Oerlikon Tool and Arms Corp., Asheville, N. C., has joined the company as a process engineer. John Gyenge, previously a rubber development chemist at the Akron University Government Laboratories, has been named a rubber technical service chemist. Robert W. Kreider, who formerly worked for Devoe & Raynolds Co., Inc., and for the Atlas Powder Co., has been appointed a paint chemist.

"Think we ought to sell the Bag-O-Matic?"

Semet Names Representative

Semet-Solvay Petrochemical Division, Allied Chemical & Dye Corp., New York, N. Y., will use the services and facilities of the chemical sales firm Thompson-Hayward Chemical Co., Kansas City, Mo., to make possible improved warehousing and technical service for Semet's "A-C Polyethylene" accounts throughout the midwest and south central area of the United States. Thompson-Hayward will market A-C Polyethylene through sales offices and warehouses which are located in 17 states; namely, Minnesota, Nebraska, Kansas, Missouri, Arkansas, Oklahoma, Texas, Louisiana, Albama, Mississippi, Southern portion of Illinois and Indiana, and the Western portion of Iowa, Kentucky, Tennessee, Georgia and Florida. The Thompson-Hayward technical representatives, with extensive experience in the field of rubber, paper, plastics, paints, inks, colors, boxboard, waxes, and coatings, will supplement Semet-Solvay's own technical service group in matters relative to the handling of A-C Polyethylene.

Develops 14-Inch Tire Line

A full line of passenger tires in the 14-inch size has been developed by the Armstrong Rubber Co., West Haven, Conn., according to an announcement by President Frederick Machlin. The new, fatter tires will reduce car heights and with their larger sections and lower pressure will provide better ride and increased comfort, the company states. While the inside diameter of these tires has been decreased to 14 inches, the width has been increased approximately one-half inch to permit greater air volume and a drop of air pressure from 24 to 20 pounds per square inch. Thus the tire, capable of carrying the same load as previously, can more easily cushion shocks, bumps and vibrations.

The new tires will be manufactured in Armstrong's "Premium", "Miracle" and "Silent Storm King" tread designs and will also feature improved rayon cord and several patented Armstrong exclusives.

Expanding Waterford Plant Site

The acquisition of more than 60 acres of land adjacent to the Silicone Products Department, General Electric Co., Waterford, N. Y., has been announced by Dr. Charles E. Reed, general manager of the department. The land was obtained to provide adequate room for planned expansion of production, research, and administration facilities. The latest land transactions will bring the over-all plant site to more than 160 acres. The Waterford plant is a completely integrated silicone production unit, making basic chemical intermediates and silicone gums, rubbers, resins, emulsions, and specialties. Its capacity has been increased several times since production of silicones was started in May, 1947.

"Pliovic DB80V and Pliovic DB90V" is the title of Tech-Book Bulletin 55-360 published by the Chemical Division of the Goodyear Tire & Rubber Co., Akron, Ohio. Copies are available from the company.

Mullen Named Board Member

Carl Mullen

The appointment of Carl Mullen, head of the Industrial Engineering Department, as a member of the board of management for the Gates Rubber Co., Denver, Colo., has been announced by C. C. Gates, president. Mr. Mullen, who received his degree in chemical engineering from Colorado A. & M. College, began working at Gates as a development engineer in the Technical Department, and for several years he did compounding and product development work in the Molded Rubber Goods, Belts, and Hose Division. Other positions he held were manager of the Hose Development Division, manager of hose and belt development and research, and assistant to the vice-president in charge of technical development and research. Last January, Mr. Mullen was named head of the Industrial Engineering Department. He is vice-chairman of SAE-ASTM Technical Committee "A" on Automotive Rubber and chairman of the Ordnance Advisory Committee on Hose Products.

QM Traction Test Device

The Quartermaster Research and Development Command, Natick, Mass., has announced the completion of initial tests of a device, the "Adjustable-Angle Traction Test Incline," to be used in the evaluation of the traction efficiency of various Army combat boots under all known terrain conditions. These conditions are provided by interchangeable pallets which range from ice, snow, mud and metal surfaces to rocks, gravel, concrete, shale or grass. The adjustable-angle feature will indicate the degrees of gradient at which a given type of outsole will function efficiently. The unit, made of steel, has two 18-foot traction ramps, each 4 feet wide, attached to a platform 18 feet high. Each ramp is bordered by steps and guide ropes as a safety precaution during the making of slow motion and still photography studies of tests. Two hand-operated winches control the height of the platform, to which the upper ends of the ramps are attached. The adjustment of the platform determines the gradient of the ramps from 0° to 45°.

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SM-62 Mold Release Emulsion

An improved silicone mold release emulsion, designed to give finer surface detail, better surface finish, and greater economy in emulsion system operation, has been developed by the Silicone Products Department of the General Electric Co., Waterford, N. Y. It is designated as "SM-62" in the department's product line. In 1949, G-E offered "SM-61", believed to be the first stable emulsion for rubber and plastic mold release. Since that time, silicone emulsions have become widely adopted by major molded rubber product manufacturers and the plastics molding industry. Despite the high performance expected of SM-62, other emulsions now sold by the department, including the popular SM-61, will continue to be marketed to customers in the rubber and plastics molding trades. Product data sheets on the properties, performance and applications of SM-62 may be obtained by writing the Silicone Products Department, General Electric Co., Waterford, N. Y.

Rigid PVC Standard Issued

Commercial Standard CS201-55 for rigid polyvinyl chloride plastics sheets has been issued by the Commodity Standards Division, U. S. Department of Commerce. The establishment of this Standard and Amendment No. 1 to it was proposed by the Thermoplastic Structures Division of the Society of the Plastics Industry, Inc. Standard CS201-55 covers physical and chemical properties, methods of test for high impact and normal impact chemical-resistant rigid polyvinyl chloride plastic sheets. These sheets are suitable for fabricating equipment and structures by hot-forming and plastic-welding techniques. Amendment No. 1 covers the two hallmarks that have been adopted for the use of manufacturers in identifying products conforming to this Standard. The hallmark for Type I covers the normal impact chemically resistant rigid PVC sheets, while Type II covers the high impact, chemically resistant rigid PVC sheets.

Spray Plastisols and Organosols

Watson-Standard Co., Pittsburgh, Penna., now has available a complete series of sprayable dispersions in both plastisol (100% solids) and organosol formulations (80-100% solids). The plastisols, which are sprayable as supplied, provide a compound free of volatile ingredients and may be sprayed on vertical surfaces without sagging. This type of coating is available in variable degrees of gloss and in a range of colors. The spray organosols, in addition to some advantages of the plastisols, can be produced to provide harder films with better abrasion resistance, lower fusion qualities and adjustable viscosity control, the company claims. These new compounds are supplied as liquids which may be sprayed and then converted by heat (350-400°F.) to a tough, resilient chemical resistant film or coating.

Harwick Standard Chemical Co., Akron, Ohio, has made available a new technical bulletin covering its "HSC No. 362 Silicone Emulsion."

News in Brief

Farrel-Birmingham Co., Inc., Ansonia, Conn., has moved its Chicago office to 10725 South Western Avenue, effective May 1. The new telephone number is: PRescott 9-3421.

A new specification sheet detailing design and installation information on Flex-O Rubber Dock Bumpers is now available from Bumpers, Inc., 2534 Detroit Avenue, Cleveland 13, Ohio.

Dayton Rubber has initiated a special 8-lecture, in-plant, supervisory training course held on company time and with required study. The training course includes formal courses on both general and company economics.

Brightly colored plastic floats, "Flex-Floats," which can be used as boat fenders or marine line markers, are being manufactured by Flexible Products Co., 312 Dobbs Street, Marietta, Ga. Molded in one piece, they are made of a plastisol based on Bakelite vinyl resins.

U. S. Rubber has appointed the J. T. Meehan Co. of Philadelphia, Penna., as distributors of its power transmission belts in the Delaware Valley area.

Pennsylvania Industrial Chemical Co., Clairton, Penna., has opened a Boston district sales office at 31 St. James Avenue, Boston, 16, Mass. All lcl and ltl shipments will be handled from the warehouse at this address for the New England area.

Martin Rubber Co., Long Branch, N. J., is now offering colorful display cartons for its King Neptune or Rocket lines of swim specialties.

DuPont has announced price cuts on six grades of "Elvanol" polyvinyl alcohol, ranging from 2 cents to 10 cents a pound.

Now available from Sears, Roebuck & Co. is a new "Happi-Time" pool kit, containing a Krene pool liner, motor, edge coping, suction cleaner, skimming box, chlorine tester and a supply of filtering material.

A new color performance chart for hot die stamping has been prepared by M. Swift & Sons, Inc., 10 Love Lane, Hartford, Conn., specifying which Swift products should be used on a variety of surfaces.

The New York offices of the M. W. Kellogg Co. have been consolidated at 711 Third Avenue, New York 17, N. Y. The telephone number is: OXford 7-5200.

The fatty esters of glycerol, glycols and polyethylene glycols are described in a new 24-page catalog published by the Glyco Products Co., New York, N. Y.

Adhesive Products Corp., New York, N.Y., has developed "No. 3570 Polygriptex," a flexible plastic base adhesive, which makes it possible to bond polyethylene to chip and kraft board.

A 64-page illustrated handbook on highway and off-the-road tires is now available from Goodrich.

Phillips Chemical has established a new Plastics Sales Division district sales office at Bartlesville, Okla., to serve the southwestern and southern states.

Lumelite Corp., Pawling, N. Y., has developed a new, unbreakable all-plastic medicine dropper, made of Bakelite polyethylene, that releases uniform droplets.

Rubba, Inc., New York, N. Y., has announced the development of "Rubbagrip," a new adhesive for sponge rubber gasketing to painted or baked metal in automotive and refrigeration plants.

A new 40-page thermocouple data booklet has been published by the Barber-Colman Co., Rockford, Ill., which discusses construction and application of thermocouples and radiation detectors as used on industrial control application. Ask for Wheelco Data Book F 5228-3.

Phillips Chemical has moved its Western District sales office of the Rubber Chemicals Division to 111 South York Street, Elmhurst, Ill.

Dow Corning Corp. has moved its Chicago office to 6101 West Fullerton, Chicago 39.

A coatings system, based on Pliolite latex, has been devised for the pigment dyeing of paper leno fabrics. Because of its unusual capacity for binding pigments and fibers, the system is said to offer substantial savings.

Fisk Rubber Division of U. S. Rubber is celebrating the 50th anniversary of its world-known trademark, the "Fisk Boy" and his "Time to Re-Tire" slogan.

Historical events in man's development and utilization of electricity are featured in a series of 1956 calendars being distributed by the Wire and Cable Department of U. S. Rubber.

Greater Boston area telephone directories for 1956 were left on the doorstep in transparent film bags made of Bakelite polyethylene.

New York Rubber Corp. has announced a change in its telephone number to LExington 2-2777. The company address remains the same, 100 Park Avenue, New York 17, N. Y.

Pawling Rubber Corp., Pawling, N. Y., has been awarded a contract to supply the U. S. Army with 765,000 service cap crowns for $73,057.50.

Techniques for the safe storage and handling of acrylonitrile are discussed in a three-page technical service bulletin available on request from Department SI, Monsanto Chemical Co., Springfield, Mass.

The Commercial Development Division, American Machine & Foundry Co., New York, N. Y., has introduced a new electrically insulated metal foil, "Amfoil," consisting of various metal foils coated on one or both sides with a continuous film of Teflon. Principal use is in subminiature capacitors, coil forms, transformers, shielding, and flexible packaging.

Boco Industries, Inc., 19424 West Eight Mile Road, Detroit 19, Mich., has developed a simple joint-covering device, "Boca Tile Clips," molded of Bakelite polyethylene. The clips keep soil and stones from working their way into sewage disposal systems.

Petroleum Chemicals, Inc., has announced plans for the construction of a petrochemical plant at Lake Charles, La., to produce ammonia for use as a fertilizer and in making plastics and various petrochemical products.

Volume V, No. 1 of the Hycar Technical Newsletter, published by Goodrich Chemical, describes Hycar resilient compounds, removal of Hycar and Hycar-phenolic cements from metal, and SC specifications. Copies are available on request.

Adhesive Products Corp., New York, N. Y., has developed a liquid contact adhesive, "Prestix," which makes contact decorating possible with any fabric, plastic or leather.

Advance Solvents & Chemical, 245 Fifth Avenue, New York, N. Y., has made available two new auxiliary vinyl resin stabilizers, "Advastab XCH-101" and "Advastab XCH-201," which are said to be particularly effective in the presence of barium, cadmium, barium-cadium, and barium-zinc compounds.

"Merac as a Latex Accelerator" is the subject covered in a Hycar Latex Newsletter published by Goodrich Chemical. Ask for Issue No. 11.

Plastic row covers, made of Bakelite polyethylene resins, have helped to extend the growing season for top-quality lettuce and tomatoes four months at the University of Kentucky Agricultural Experimental Station, Lexington, Ky.

The 20th Anniversary National Time and Motion Study and Management Clinic sponsored by the Industrial Management Society will be held on October 31-November 2 at the Sherman Hotel, Chicago, Ill. Address inquiries to the Industrial Management Society, 35 East Wacker Drive, Chicago 1, Ill.

New Silicone Plant in Production

Several units of the new Long Reach, West Va., plant of the Silicones Division, Union Carbide and Carbon Corp., are now in operation, according to T. J. Coleman, division general manager. Built to help meet the ever-expanding demand for silicones, the plant is on the Ohio River, between Parkersburg and Wheeling. There are now 171 persons employed at Long Reach. Employment is expected shortly to rise to 250, and eventually to about 360, Mr. Coleman said. The plant consists of eight principal service buildings, six process buildings, five outdoor-type service structures, four outdoor-type process structure and nine outdoor storage tank areas. The office and laboratory is a two-story brick building, with air-conditioning. Union Carbide has 1,431 acres at Long Reach, which awere acquired with a view to future expansion. Already the reactor capacity has been increased beyond the original designs, and plans are being drawn for additional equipment for compounding silicone rubbers.

Opens New District Office

The establishment of a New England District Office in Boston and the appointment of James K. Stevenson as district manager have been announced by the Pennsylvania Industrial Chemical Corp., Clairton, Penn. The new office will be located at 31 St. James Avenue, Boston, Mass. Mr. Stevenson joined the company in 1952 after service with Battelle Memorial Institute as a research engineer in the Rubber and Plastics Division. He also had been previously associated with Monsanto Chemical Co. Mr. Stevenson is a graduate of Ohio State University, where he was a research assistant on API pure hydrocarbons program.

Pure Flake Trimethylolpropane

The commercial production of pure-grade flake trimethylolpropane has been announced by the Chemical Division of Celanese Corp. of America, New York, N. Y. Its lower cost in carload quantities, Celanese reports, now enables economic use of this high-quality aldol product in a number of basic processing areas. In the pure flake form, it offers significant potential in plasticizers, surface active agents and polyesters. It also affords greater mixing ease in compounding polyesters and pre-polymers with diisocyanates.

Management Performance Cited

The 1956 "Manual of Excellent Managements," published by the American Institute of Management, has singled out the B. F. Goodrich Co., Akron, Ohio, as deserving particular merit for excellence in some of the Institute's areas of management appraisal. B. F. Goodrich Co. is particularly cited by the Institute for the selection, active participation and contributions of its board members, and for astute financial planning along with effective budgetary and inventory controls.

Ericson Joins Whittaker

Kenneth W. Ericson

Kenneth W. Ericson has joined Whittaker, Clark & Daniels, Inc., New York, N. Y., for the purpose of developing and promoting the sales of chemical colors such as the phthalocyanines and ultramarines. He was chosen for this position because of his wide acquaintance and experience in the pigment industry. Mr. Ericson was formerly general sales manager of the Titanium Pigment Corp. and retired from that organization a year ago, after 26 years of service with the company.

Utilizing Tubeless Tires

Tubeless tires have been made standard equipment on all Studebaker Transtar trucks, according to William A. Keller, Studebaker division general sales manager. Mr. Keller said that conventional tires and tubes will continue to be available as optional equipment at no additional charge. Greater safety and economy are the advantages of the tubeless tires, he stated. Blowout resistance is built into the tires with the air sealant replacing the tube, and friction between tube and tire is eliminated, reducing heat build-up and prolonging tire life. The automotive official said that Studebaker anticipates that 85% of orders will call for tubeless tires as a result of a recent Studebaker survey of individual truck operators and fleet owners which showed 54% of them were planning for tubeless tire use while 46% have some tubeless units in use at present.

Tar-Rubber Joint Sealer

Studebaker Chemical Co., Elyria, Ohio, has developed a tar-rubber compound for filling expansion joints in concrete runways for jet aircraft. Known as "SCCO" Hot Poured Joint Sealer, the compound meets interim federal specifications and is prepared by adding "Chemigum" latex to tar with specially developed plasticizers and catalysts. Joints made air tight with SCCO are impervious to moisture infiltration through repeated cycles of expansion and contraction, the company states. Because of the homogeneity of the sealer compound, joints can be maintained with a high degree of solvent resistance and adhesiveness in tropical climates as well as in sub-freezing zones.

Revised Radioisotope Catalog

A revised Radioisotope Catalog, issued by Oak Ridge National Laboratory, is now available on request to scientific institutions, medical centers, industrial laboratories and other qualified persons, according to an announcement made by the laboratory, which the Union Carbide and Carbon Corp. operates for the Atomic Energy Commission. Nearly 100 different radioactive preparations made and distributed by the laboratory are listed together with their respective specifications and price. Special sections of the book are devoted to descriptions of the irradiation facilities in use, procedure for the procurement of isotopes, shipping information, special sources available, service or custom irradiations, neutron-activation analysis, and the laboratory's waste disposal service for users. The catalog, or information about radioisotopes produced at Oak Ridge National Laboratory, may be obtained by writing to: Oak Ridge National Laboratory, Union Carbide Nuclear Co., Radioisotope Sales Department, P. O. Box P, Oak Ridge, Tenn.

To Build Resorcinol Plant

Heyden Chemical Corp., New York, N. Y., has announced plans to construct a new plant at Fords, N. J., with capacity for 3,000,000 pounds of resorcinol, an essential ingredient in waterproof glues and adhesives, which is finding increasing use in manufacture of nylon and rayon cord reinforced tires, and in other important industrial applications. Engineering is now under way for the new Heyden plant. Construction is scheduled to begin in the first quarter of 1957 and completion is planned by December 1, 1957. The new plant, which will have provision for further expansion, will produce resorcinol by an improved process developed in Heyden's research laboratories. Heyden will discontinue its original commercial resorcinol unit at Garfield, N. J.

NRL Information Made Available

The Naval Research Laboratory's "Report of NRL Progress," a new source of research information in many fields of industrial interest, has been made available to the public for the first time. Each issue of the monthly publication contains articles and "problem notes" concerning NRL unclassified research and development in progress. "A Rubber Compatible and Ice-Resistant Lubricant for Aircraft Ordnance," appearing in the February issue, is typical of the articles published. Distribution will be handled by the Office of Technical Services, U. S. Department of Commerce.

L-41 Diethyl Silicone Oil

Silicones Division, Union Carbide and Carbon Corp., New York, N.Y. has announced that the diethyl silicone oil, "L-41," is now available to industry on a commercial scale. L-41 had been available in development quantities for several years. Commercial quantities have been made possible now that the company's new silicones plant located at Long Reach, West Va., is in production.

Financial News

U. S. Rubber Co.

Six Months to June 30: Net income of $18,659,106, which is equal to $2.97 per share of common stock, compared with $19,005,463, or $3.03 per common share, in the corresponding period of the previous year. Net sales set a new record of $464,095,454, against $457,039,061 in the same period of 1955. Net income was 4.0% of sales in the first six months of this year, compared with 4.2% in 1955.

McNeil Machine & Engineering Co.

Six Months to June 30: Net income of $1,362,273, which is equal to $2.32 per common share, compared with $1,233,745, or $2.14 per common share, in the corresponding period of the previous year. Results for 1956 include operations of the Lincoln Engineering Division since May 1, the date of merger.

Thermoid Company

Six months to June 30: Net income of $898,943, which is equal to $1.02 a common share, compared with $703,204, or 81c a common share, for the corresponding period of the preceding year. Gross sales totaled $20,295,702, against $18,036,007 for the first six months of 1955.

American Hard Rubber Co.

Twenty-Four Weeks to June 17: Net income of $586,659, which is equal to $1.69 per common share, compared with $358,179, or 97c per common share, in the corresponding period of the preceding year. Net sales totaled $13,122,321, against $9,616,054 in the same period of 1955.

Cooper Tire & Rubber Co.

Six Months to June 30: Net income of $301,287, which is equal to $1.92 per share, compared with $180,628, or $1.15 per share, in the same period of the preceding year. Net sales amounted to $12,980,871, against $10,190,391 in the first six months of 1955.

Okonite Company

Six months to June 30: Net income of $982,747, which is equal to $5.09 per share, compared with $672,331, or $3.72 per share, in the corresponding period of the preceding year.

DeVilbiss Company

Six Months to June 30: Net income of $773,848, which is equal to $2.15 per share, compared with $507,807, or $1.35 per share, in the corresponding period of the preceding year.

Take issue with something in this edition? Write a letter to the editor! (See page 734).

Rome Cable Corporation

Quarter to June 30: Net income of $540,000, which is equal to $1.02 per share, compared with $380,000, or 74c per share, in the comparable period of 1955. Sales declined from the March quarter because of inventory liquidation by consumers as a result of weakness in the price of copper, the company stated.

Hewitt-Robins, Inc.

Six Months to June 30: Net income of $513,313, which is equal to $1.50 per common share, compared with $485,271, or $1.57 per common share, in the corresponding period of the previous year. Net sales amounted to $25,616,250, against $21,479,077 in the same six month period of 1955, an increase of approximately 19 percent.

Electric Auto-Lite Co.

Six Months to June 30: Net income of $2,421,306, which is equal to $1.51 per share, compared with $6,265,069, or $3.91 per share, in the same period of 1955. Net sales totaled $117,972,029, against $156,364,441 for the first six months' period of the preceding year.

General Cable Corp.

Six Months to June 30: Net income of $5,491,047, which is equal to $1.93 a common share compared with $2,950,114, or $1.27 a share, in the corresponding period of the previous year. There were 2,727,424 and 2,110,332 shares outstanding in the respective periods.

General Tire & Rubber Co.

Six Months to May 31: Estimated income of $4,027,431 compared with $4,027,153 in the same fiscal period a year ago. Net sales totaled $177,796,438, against $135,342,661 for the corresponding period of the preceding year.

Wyandotte Chemicals Corp.

Six Months to June 30: Net income of $2,157,700, which is equal to $1.33 per common share, compared with a loss of $1,444,811 in the first half of 1955. Net sales for the first half of 1956 totaled $37,194,000.

Thiokol Chemical Corp.

Six Months to June 30: Net income of $386,516, which is equal to 85c a share, compared with $269,028, or 75c a share, in the corresponding period of the preceding year.

Anaconda Wire & Cable Co.

Quarter to March 31: Net income of $2,644,205, which is equal to $3.13 per share, compared with $1,259,541, or $1.49 per share, for the corresponding quarter of the preceding year.

Announces 14-Inch Tire Line

General Tire & Rubber Co., Akron, Ohio, has announced the development of a new line of 14-inch diameter tires designed to meet the needs of modern automotive styling. The first tire out in the new line will be the "General Tubeless," designed for 1957 automobiles. The company is also prepared to produce 14-inch tires in its other top lines. A bigger tire than its 15-inch counterpart, the 14-inch General Tubeless will weigh about one-half pound more. Although smaller in over-all height, it will be larger in cross-sectional girth. For example, cars that formerly used a 6.70 x 15 casing will now use a 7.50 x 14. The increased cross-section is necessary for equivalent load-carrying capacity. While the new tire will lower the automotive silhouette, it will also put more rubber on the road for improved tractive power and stability and a slower rate of wear. The wider tread and lower air pressure will contribute to longer mileage. General Tire first introduced a 14-inch tire some twenty-five years ago, at a time when the standard rim diameter was 17 inches. The company sold 14-inch tire-wheel assemblies for all popular brands of automobiles from 1932 on to as late as 1950. Recommended air pressure on the new General Tire line of 14-inch tubeless tires is approximately 22 pounds.

Goodrich Educational Program

A $300,000 program of financial aid to higher education that includes scholarships, employe gift matching and tuition sharing has been announced by John L. Collyer, chairman of the board, and W. S. Richardson, president of the B. F. Goodrich Co., Akron, Ohio. The company will award seven four-year scholarships to high school graduates in the United States in 1956. The amounts of the awards will be based on the students' needs, ranging from $100 a year to full tuition and living costs.

For each scholarship the company will make an additional contribution to the college or university of an amount up to full tuition, to assist the school's educational programs. The company will also share costs of tuition and fees with employes for job-connected courses of higher training and will make grants to the institution furnishing instructional services. Employes' personal gifts to colleges and universities will be matched by the company. In addition to the $300,000 voluntary aid to higher education, the B. F. Goodrich Co. is contributing in 1956 at least $153,000 of tax aid to publicly supported institutions of higher education in states where their plants are located, company officials state.

To Construct Polyvinyl Plant

Cary Chemicals, Inc., Milltown, N. J., has announced plans for the construction of a plant for the manufacture of polyvinyl chloride resin and allied polymers and copolymers. The estimated cost of the plant is $1,150,000. Cary has filed with the Securities and Exchange Commission for a stock and bond issue to cover financing of the project.

L-522 Organo-Silicone Compound

A new application for one of their organo-silicone materials as a release agent in the tire industry has been announced by the Silicones Division, Union Carbide and Carbon Corp., New York, N. Y. The compound, originally given the experimental designation X-522, is now marketed as Union Carbide "L-522" organo-silicone compound. This L-522 is a low-viscosity, light yellow liquid. It is soluble in organic liquids, both aromatic and aliphatic types, and is insoluble in water. Its acceptance by the tire industry is based on the successful combination by Silicones Division chemists of the release properties of silicone oils with the lubricity of certain organic oils. Tire manufacturers have two principal surface problems: forming and releasing a sharply defined tread, and lubricating and releasing the bladder, or bag, that is used inside the tire to force it into the mold. Butyl rubber has always been used for this bag because of its ability to resist steam, and it was important to find a lubricant which would allow it to slide in neatly and subsequently to release easily. From a series of organo-silicone compounds possessing this dual property of release and lubrication, X-522 proved to be the most effective one for tire manufacturing, the company states. With commercial specifications now set, it has become an established product, L-522.

Union Carbide chemists point out that L-522 also has other advantages in the tire factory. For example, conventional silicones tend to prevent the adhesion of the rubber label which is placed on every tire, while L-522 does not. L-522 also has been found to be compatible with the "balancing dough" which is used to add weight to any portion of the tire that needs it to make the tire properly balanced. A number of tire-producing plants have found that L-522 is both economical and effective. Formulations, or paints, containing L-522 have been widely used both inside and outside the green tire, and in both "Bag-O-Matic" and conventional machines.

The inside formulations are generally designed for good lubricity and release between the Butyl rubber bag and the tire. They usually contain from 1 to 5% L-522 in white gasoline with mica dust and pigment. For added lubricity they may also contain 10 to 15% of other conventional tire lubricants.

Plans New Formaldehyde Plant

The Chemical Division of the Borden Co. has announced plans to build a new formaldehyde and synthetic resin plant in Fayetteville, N. C. Scheduled for completion late in 1956, the plant will be geared to produce 36,000,000 pounds of formaldehyde a year. Added to the output of Borden's present four formaldehyde plants, the total production will equal 12% of total domestic consumption, the company states. The Fayetteville plant will complete Borden's chain of formaldehyde plants on the east coast. It will manufacture formaldehyde and from it urea resins. The plant will also serve as a warehouse for polyvinyl acetate and polyvinyl alcohol. Fully automated, it will employ about 25 persons.

Itemizes Rubber Research

According to the U.S. Department of Commerce, the rubber products industry spent almost $54,000,000 on research and development work in 1953 with the larger firms accounting for the lion's share. The companies employing 5,000 or more workers, representing some 3% of those reporting research and development costs, accounted for 87% of the expenditures. Companies having less than 1,000 employees, 87% of the total, accounted for only 7% of the outlays for research and development. Rubber products companies spent $3,100,000 on basic research, or about 6% of their total research and development costs. This was slightly higher than the average of 4% for all industries.

Intense competition and anticipation of the future have always characterized the rubber products industry. This is illustrated by the fact that almost half of the 7,800 scientists and engineers employed by rubber products companies in January, 1954, were engaged in research and development work. In all manufacturing industries, only about one-third of the scientists and engineers were so engaged. For the year 1953, the rubber products industry was slightly below the all-industry averages for research and development costs per production worker, and for the ratio of these costs to sales.

A number of large rubber companies which formerly produced little besides rubber products, now also make products of plastics, plastics and rubber, and other materials, in volume. Many of these companies also own large chemical plants as well as the synthetic rubber plants formerly owned by the Government. Results of research and development work conducted by these chemical affiliates are available to the rubber products plants and affinity in these two fields has recently become closer, the Department states.

Barrett Wall Cove Compounds

Barrett Applications Laboratory, Barrett Division, New York, N. Y., has developed two compounds for low cost wall cove formulas in the preferred Shore A Durometer hardness range of 95 ± 5. In the development of Barrett compounds Nos. 3099-D and 3099-F, relatively large proportions of reclaimed rubber and fillers, with selected softeners were used to provide economy, smooth processibility and the preferred hardness. A combination of Cumar resin, MH-3 grade, BRC 22 hydrocarbon and Plaskon polyethylene lubricant 8407 were used for these properties. The use of these compounds for wall coving makes a snug and lasting joint.

Undertakes Expansion Program

An expanded production and sales program for the Sun Rubber Co., Barberton, Ohio, has been outlined by T. W. Smith, Jr., president. Two new vice-presidents and an executive committee have been named to help carry out the project. Albert Nylund, Jr., a former member of a Philadelphia management consultant firm, has been elected vice-president in charge of manufacturing. Charles Rippey of Akron has been named vice-president in charge of the newly formed Technical Division, which will include engineering, research and development. Serving on the executive committee, of which Mr. Smith will be chairman, are Mr. Nylund; Mr. Rippey; S. C. Andress, secretary; W. S. Raymer, vice-president-controller; William R. Lantz, vice-president-merchandise manager; T. B. Roberts, vice-president-sales, and Ray D. Page, a director. The expansion plan is already under way in the Industrial Sales Division, and a new product development program in the consumer goods field is in progress to bring about an improved year-round employment for the more than 1,000 employes of the Barberton plant. To provide office space and facilities for the new Technical Division, a building program has been started under the direction of Mr. Rippey. Serving on Mr. Rippey's staff will be Paul Rekettye, named chief engineer in charge of mechanical design and processing; C. E. Draper, technical director of rubber operations; Dean Widrig, named plant engineer in charge of maintenance, construction and ship facilities, and Vaughn Valentine, named technical director of vinyl operations.

New Dewey & Almy Officers

Hugh S. Ferguson, executive vice-president in charge of the chemical group of W. R. Grace & Co., has announced the election of George W. Blackwood as president and William L. Taggart, Jr., as executive vice-president of Dewey and Almy Chemical Co. Division of W. R. Grace & Co. Mr. Blackwood joined the company in 1937 upon his graduation from Harvard and has been actively associated with the various phases of the Container and Chemical Specialties Division of the company. He has been a vice-president of Dewey and Almy since 1952. Mr. Taggart joined Dewey and Almy in 1927 upon his graduation from Massachusetts Institute of Technology. He has been associated with manufacturing and management activities of the company's seventeen plants all over the world. He has been a vice-president of Dewey and Almy since 1948.

Goodrich Promotes Haas

Willard Haas, formerly technical manager of hose for the B. F. Goodrich Industrial Products Co., Akron, Ohio, has been named senior development engineer, responsible for field engineering and development of all hose manufactured by the company. Mr. Haas joined the B. F. Goodrich Industrial Products Co. in 1929 after graduating from Macalester College, where he received a B.A. degree. He is a member of the Society of Automotive Engineers.

Four Receive Dinsmore Award

Four technical development personnel of the Goodyear Tire & Rubber Co., Akron, Ohio, have received the Dinsmore Merit Award for outstanding achievement in 1955. Recipients of the awards were L. R. Kilpatrick, manager, airship envelope development; J. F. Purdy, tire mathematician; E. T. Duke in charge of camelback and repair materials, and G. W. Rye, designer. Mr. Kilpatrick, a graduate of the University of Alabama, received his award for work on the airship envelope and rubberized fabric development in conjunction with Goodyear Aircraft and the Navy. Mr. Purdy, who has been with Goodyear for 39 years, was recognized for outstanding accomplishments in tire mathematics and mechanics. Mr. Duke, a graduate of Pennsylvania State College, was recognized for excellent development efforts in the line of camelback and repair materials. Mr. Rye, a graduate of Iowa State, received his award for promoting and developing a basic improvement in the cord adhesion of short cure passenger car and truck tires.

General Tire Stock Issue

General Tire & Rubber Co., Akron, Ohio, has asked the Securities and Exchange Commission to register a series of securities that it plans to use in purchasing control of the A. M. Byers Co., Pittsburgh, Penna. The S.E.C. said General Tire had filed registration papers for 134,717 shares of $5 cumulative preference stock of $100 par value and 134,717 warrants to purchase as many shares of General Tire common. The exchange ratio for the Byers preferred stock was not announced. The ratio for the common stock would be one share of General Tire preference stock and a warrant to buy one General Tire common share for each 3½ shares of Byers common. If at least 100,000 shares of Byers common were deposited prior to expiration of the offer, the ratio would be cut to three shares of Byers in the exchange.

Tracerlab Names Representative

William B. Fitzmaurice has been appointed Industrial Division sales representative in the New England area for Tracerlab, Inc., Boston, Mass. In his new position, Mr. Fitzmaurice will handle the promotion and sales of Tracerlab's nuclear services to New England industry. Mr. Fitzmaurice joined Tracerlab as a field engineer in 1951. He graduated with a B.S. degree in mathematics in 1947, and later did graduate work in advance physics at Tufts College.

New Mohawk Plant To Open In Fall

Mohawk Rubber Co., Akron, Ohio, has announced that its new plant at West Helena, Ark., will begin operations about September 1. The plant is expected to employ about 200 workers initially and increase its force to about 600 in a year. The Helena-West Helena Industrial Development Corp. has issued about $800,000 in bonds to purchase a building and property for the company.

FINANCIAL BRIEFS

National Standard Co., Niles, Mich., has declared a common stock distribution of one additional share for each two shares held, payable on September 26 to holders of record September 13. In addition, the regular quarterly dividend of 50 cents a share was voted on the present stock payable September 25. "The board hopes to maintain a quarterly dividend of 40 cents after distribution of the additional shares, which would be on the basis of $1.60 a year," stated W. H. Parkin, chairman. This would be equal to an annual dividend rate of $2.40 on the present shares, he noted. The company paid an extra of 50 cents in January, to bring payments for the fiscal year ending September 30 to $2.50 on the present stock.

A 97,950 share ($1,028,475) offering of Cooper Tire & Rubber Co. (Cleveland, Ohio) common stock made at $10.50 per share has been completed. Stockholders of the company subscribed to 64,303 shares of the total on the basis of 1¼ shares for each two held. After subscription rights expired July 12, the balance of the issue was sold publicly.

Of 64,605 new shares of the Thiokol Chemical Corp., Trenton, N. J., offered to company shareholders, 64,153 shares were subscribed by the exercise of rights. The remaining 452 shares were taken up by underwriters and sold in their behalf by Lehman Brothers, manager.

Lee R. Jackson, president of the Firestone Tire & Rubber Co., Akron, Ohio, has acquired 6,000 common shares through stock option, increasing direct ownership to 31,902.

P. W. Litchfield, chairman of the Goodyear Tire & Rubber Co., Akron, Ohio, has sold 3,000 common shares, reducing direct ownership to 44,567.

Edward Lamb, a director of the Seiberling Rubber Co., shows direct holdings of 2,850 common shares and indirect holdings of 7,695 at April 30, 1956.

A 70,000 share offering of Hewitt-Robins, Inc., common stock has been oversubscribed and the books closed. The stock was offered at $40 a share. Proceeds will be used to reduce short-term bank loans and add to working capital.

John L. Collyer, chairman of the B. F. Goodrich Co., has bought 10,002 common shares and made gifts of 200, making holdings 58,054.

Bliss Acquires Robertson

E. W. Bliss Co., Canton, Ohio, has acquired ownership of the John Robertson Co., Inc., Brooklyn, N. Y., according to a recent announcement by Robert Potter, president of Bliss. Robertson will operate as a wholly owned subsidiary. Clifford C. Childress, president of Robertson, will continue in charge of the subsidiary on a long term contract.

Colombian Plant In Operation

The new Seiberling Rubber Co. affiliate tire plant in Colombia, South America, which began production last March, is now operating at 60% capacity and already is the second largest American tire producer in Colombia, according to an announcement by Harry P. Schrank, executive vice-president. The plant is now on a three-shift schedule. Fifteen thousand square feet of manufacturing space have been added to the main plant at Bogota which will incorporate facilities from the company's Industrial Products Division, Almacen Villegas, now located five miles outside of Bogota. The most modern rubber manufacturing equipment will be installed in the plant addition when it begins operations in September. While passenger car and truck tires will comprise the bulk of Seiberling's output during the first year, the Bogota plant is also producing rubber floor mats for automobiles, inner tubes, truck tire flaps and tread rubber stock.

Named Assistant Factory Manager

Armstrong Rubber Co., West Haven, Conn., has announced the appointment of Ernest O. Edelmann as assistant factory manager of the West Haven plant. Mr. Edelmann will be responsible for all problems relating to the quantity and quality of production at the plant. He was employed by Armstrong in 1950 as coordinator of product control. Prior to his association with Armstrong, he was affiliated with the Firestone Tire & Rubber Co. for 18 years as tire development engineer and as production manager of an associate plant in Sweden. A graduate chemical engineer from the University of Illinois, Mr. Edelmann is a member of the American Society for Quality Control, the American Chemical Society and the Society of Automotive Engineers.

U B S Building New Plant

P. W. Atwood, president of the U B S Chemical Corp., Cambridge, Mass., has announced plans for the construction of a new plant in the Greenville Metropolitan area at Mauldin, S. C. The first phase of construction will consist of sales offices, packaging, warehousing facilities and research and development laboratory. Construction is expected to be complete July 1.

Charles V. Glynn, formerly associated with Haskins and Sells, has been named assistant treasurer and controller of U B S. He graduated from the University of Rhode Island in 1940 with a B.S. degree in accounting, and the certificate of Certified Public Accountant was issued to him in 1951.

Synthetic Fatty Acid Activator

Rubber Research Association Ltd., Ganim, Kfar Ata P. O., Israel, has released a report on the use of mixed synthetic fatty acids of petroleum origin, "Kadimic," produced by the Kadimah Chemical Corp., Haifa, Israel. These acids, produced by oxidation of a gas-oil-petroleum fraction, have been found comparable to stearic acid as an activator in rubber vulcanization.

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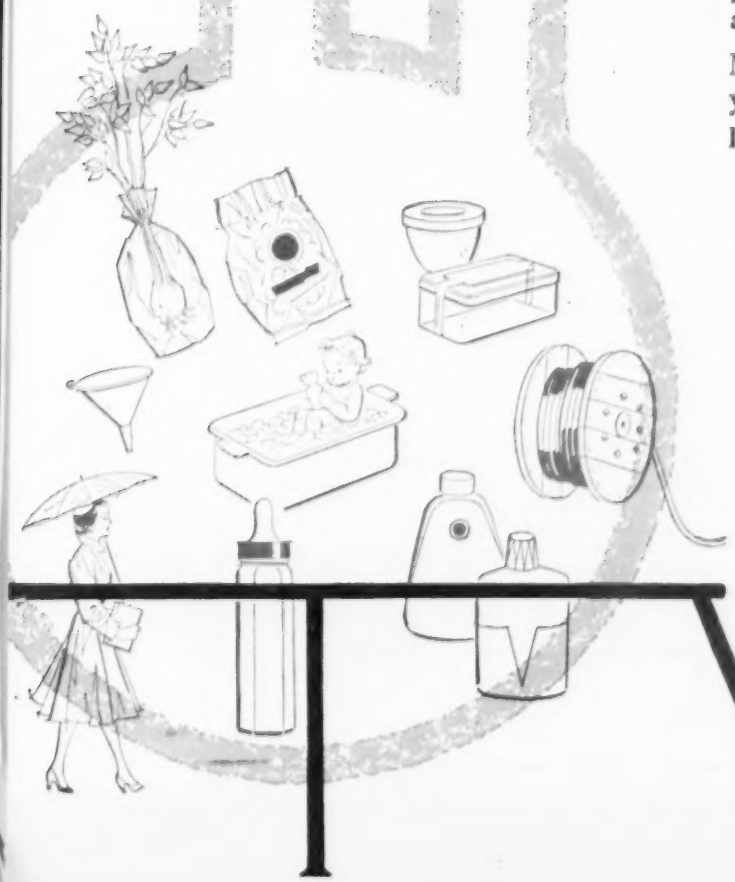

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*Manufactured by Koppers Company, Inc.

West Coast News

New passenger car tire presses have been installed at the Los Angeles plant of the B. F. Goodrich Tire Co., and are expected to boost tire output at the plant by 50%. Tires made at the Los Angeles plant are marketed throughout the 11 western states. The installation is part of a $6,000,000 expansion program now underway at the plant. The new presses are designed to produce tubeless tires, as well as conventional tires, suitable for both 14-inch and 15-inch wheels. The "Auto-Form" presses installed at the plant are of a type in which the curing bag is an integral part of the press.

Walter W. Woodward, formerly factory superintendent of the Molded Products Division of the Stauffer Chemical Co. at Los Angeles, has been named assistant general manager of the division. William K. McPherson has been named plant manager. New equipment in operation at the Molded Products Division is a new No. 9 Banbury and a 12 inch tuber. The division recently added 15,000 square feet of warehouse space to the plant.

United Carbon Co., Inc., Charleston, West Va., has announced the opening of a sales office at 3932 Wilshire Boulevard, Los Angeles. The telephone number is DUnkirk 4-9368. Burton S. Mart, Jr., formerly with the company's southern sales district at Memphis, Tenn., will be in charge of this office.

Witco Chemical Co. has announced the relocation of its San Francisco office to 80 Stonestown, San Francisco. The telephone number is LOmbard 4-1261.

Charles Evans has resigned his vice-presidency with the Arrowhead Rubber Co. of Downey, Calif., and accepted a position with the General Tire & Rubber Co.

R. D. Abbott Co. of Los Angeles has taken on the representation of the K & M Laboratory Hydraulic Press Co. of Hollywood, Calif.

William Okray has joined the Pacific Moulded Products Co. of Los Angeles as manager of production control. Mr. Okray was formerly associated with North American Aviation.

Vegetable Oil Products Co., Los Angeles, has completed a $1,000,000 expansion of its fatty acid plant. "Vopco" stearic acid and glycerine is represented to the rubber trade by B. E. Dougherty Co.

Robert Wade, formerly associated with Wade Sponge Rubber, has joined the Kirkhill Rubber Co. of Brea, Calif., as liason man between technical and production divisions.

L. E. Rabjohn, formerly manager of the Northern California district of the Firestone Industrial Products Co., has been promoted to manager of the West Coast Division for Firestone Foamex. In his new position, Mr. Rabjohn will direct activities of district offices in Seattle, San Francisco, Denver and Los Angeles.

Hugh Connealy, formerly with the Silicraft Corp., Gardena, Calif., has announced the formation of the Gardena Rubber Co. at 1642 West 135 Street, Gardena. The plant is in production on custom molding.

Clifford A. Hutter, formerly factory superintendent of the Reeves Rubber Co., San Clemente, Calif., has joined the technical staff of the Stoner Rubber Co., Anaheim, Calif. John O'Hern has joined the technical staff of Reeves Rubber as chief chemist.

Fred Owen, formerly with the Goodyear Tire & Rubber Co., Akron, Ohio, has joined the Development Department of the W. J. Voit Rubber Corp. at Los Angeles.

F. L. Beiter, previously with Golden West Rubber Products, Inc., Los Angeles, has joined the Commercial Rubber Co., Los Angeles, as general manager. Fred Campbell, formerly with Goodyear, has joined Golden West Rubber as plant manager.

Curt Wolters, formerly of the Los Angeles Standard Rubber Co., Los Angeles, has transferred to the Shalda Manufacturing Co.

Bud Mayeau, formerly with the Mansfield Tire & Rubber Co., Oakland, Calif., has joined the Master Processing Corp. as chief chemist.

RABRM Classified Information

The Research Association of British Rubber Manufacturers, Shawbury, Shrewsbury, Shropshire, England, has issued a supplement to Information Bureau Circular No. 430 which sets down an abridged version of its Systematic Classification of Scientific, Technological and Commercial Information on Rubber. Earlier this year, RABRM had sent out Circular No. 430 which set down the system in full, together with an abridged version for smaller users. This abridged version was well-received. However, it was suggested that an even more drastic cutting down might be acceptable to some users, interested in the classification of books and small collections of abstracts. The new supplement represents the further abridged version. Copies of the new supplement as well as additional information may be obtained from RABRM.

Opens Philippine Tire Plant

Production operations began in record time at the new Goodyear Tire & Rubber Co. factory in the Philippines when the first tire was taken from the mold recently. Leading Philippine business executives participated in opening ceremonies. Formal inauguration of the plant, located 12 miles from Manila, will be held at a later date. Full scale production is expected before the end of this year. The plant will supply a substantial share of the tire requirements of the Philippines. A modern one-story building, 860 feet in length, the plant was designed according to latest production standards. It will manufacture a complete line of tires, tubes, recapping materials and Neolite and rubber shoe soling slabs and heels. Active in the Philippines for the past 40 years, Goodyear has operated a rubber plantation in the islands since 1928. Since this 2,500 acre tract will supply only a portion of the new plant's requirements, additional sources of natural rubber will be developed by Goodyear in the Philippines to supply the remainder.

The following key managerial and technical appointments at the new plant have been announced: R. W. Pockmire, vice-president and general manager; N. F. Cope, treasurer; C. W. Neumann, sales manager; R. T. Budd, plant manager; and J. M. Cargal, technical superintendent. Other appointments include H. E. Mills, manager of technical services; Quentin Hutchinson, superintendent of Division A; Clifford O. McKitrick, superintendent of Division B; F. G. Shaw, manager of factory accounting; F. J. Kitchen, assistant to the treasurer; C. R. Dixon, chief engineer; Evan G. Moffitt, purchasing agent; J. Woodliff, personnel manager; N. A. Nigosian, resident engineer; assisted by Lowell Cummings, Richard Ballenger and Earl Clark, temporary construction men.

Tire Prices Increased 2-3½%

B. F. Goodrich Co., Akron, Ohio, has announced price increases for some lines of passenger and truck tires ranging from 2% to 3½%, effective July 30. The increase includes a 2% price boost for all first line and premium passenger car tires and tubes. Mud and snow tires also were lifted 2%. All truck tires and tubes in sizes of 8.25-20 and larger were increased 3½%. Prices of rear tires for farm tractors were hiked 2½%. Goodyear, Seiberling and Armstrong Rubber, West Haven, Conn., also announced tire price increases of 2% to 3½%. The firms attributed the increases to higher manufacturing costs. Other firms are expected to follow suit.

Announces "Hewitex" Trademark

Hewitt-Robins, Inc., Stamford, Conn., has announced that the trade-mark "Hewitex" will be used to designate the company's urethane foam. The company is now producing urethane foam at a temporary plant in Long Valley, N.J. A 100,000 square foot plant is being constructed at Franklin, N. J., to house permanent manufacturing facilities.

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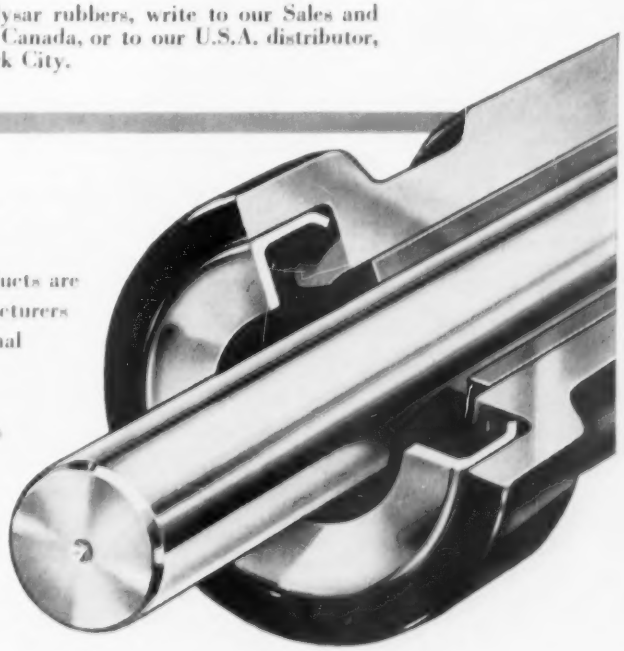

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Canadian News

Estimated net profit of DuPont of Canada Securities Ltd. and its wholly owned subsidiary, DuPont Co. of Canada Ltd., for the first half of 1956 amounted to $2,453,000, or 33c a common share, compared with $3,217,000, or 44c a common share, for the same period last year. Earnings for the half year reflect marked reductions in its textile fiber selling prices since the middle of 1955, the company reported, as well as the adverse effect of initial operating periods of its finishes plant at Ajax, Ont., and its "Freon" fluorinated hydrocarbons plant at Maitland, Ont. The lower prices for fibers are expected to result in expanding markets. Sales for the period were $32,497,000 as compared with $31,485,000 in the first half of 1955, an increase of 3%. The physical volume of shipments was 12% higher. Depreciation provision was up slightly at $2,384,000, while income taxes were substantially lower at $2,045,000 against $3,053,000.

Wooster Rubber Co., Wooster, Ohio, has announced the expansion of facilities in Canada for the production of Rubbermaid housewares. The Canadian expansion consists of the construction of a new plant to house entire rubber compounding and molding operations. It will have the latest in modern equipment to produce molded rubber housewares, which previously have been shipped into Canada from the Wooster plant. Vinyl-coated wire housewares have been produced by the company in Canada for some time and will continue to be produced there. This operation, located at Port Credit, Ontario, will be shifted in mid-October to a new plant at Cookesville, a few miles away. The new plant will also be equipped to manufacture automotive throw rugs and other automotive products.

Vansul & Co., Englewood, N. J., has announced the appointment of Columbian Carbon Ltd., Toronto, Ontario, as the exclusive representative for the sale of their complete line of color pigments and dispersions throughout Canada. With more than 30 years experience in the production of a varied line of colors for general rubber and plastic compounding, Vansul announced its intention to broaden their sales coverage and color service by the "on-the-spot" efforts of Columbian Carbon. Vansul will also make available, through Columbian Carbon, laboratory service for the development of new colors and color matching.

Canada Colors & Chemicals, Ltd., Toronto, Ontario, has been appointed distributor for A-C Polyethylene in the areas of Ontario, Quebec, and the Maritime Provinces by the Allied Chemical International Corp., New York, N. Y. Canada Colors & Chemicals, Ltd., with offices in Toronto and Montreal, have for a number of years distributed products of other divisions of Allied Chemical.

For the first time in its 15 year history, Canadian Resins & Chemicals has added another plastic material other than vinyl. Since May, the company has been manufacturing polyethylene film and flat tubing at the present facilities of its converting division at Ste. Therese, Quebec. Limited production only is available now, pending completion of the new plant which, when finished, will contain three production lines for manufacturing and treating of the polyethylene film and flat tubing. Full production is expected by the latter part of the summer.

Dominion Rubber Co., Ltd., Montreal, Que., has announced that it will construct a new warehouse, covering 6½ acres, at the rear of its Kitchener, Ont., tire plant. C. C. Thackray, president, said the expansion of the company's tire business made additional facilities necessary. The new construction is a continuation of the expansion and modernization program which has meant a capital investment in Kitchener since World War II of some $12,000,000 in the Tire Division alone, the company reported. This figure includes the latest development.

The construction of a $25,000,000 petrochemical plant to be built at Sarnia, Ontario, by Imperial Oil, Ltd., has been announced by J. R. White, president. Engineering work is under way, construction crews will move in next spring, and production is expected by the spring of 1958. The new project will produce basic chemicals.

A permit for construction of a one-story warehouse and office by the Firestone Tire & Rubber Co. of Canada has been issued by the Ottawa City Building Inspector's Office. Construction of the $85,000 building is scheduled for completion by next April.

L. F. Vauthier, formerly tires sales manager for the Quebec Division of the Dominion Rubber Co., Ltd., Montreal, has been appointed sales manager of Dominion Tires at Kitchener, Ontario. At the same time, it was announced that J. D. Ferguson was named assistant sales manager of Dominion Tires. In this position, Mr. Ferguson will also carry the responsibilities of the Manufacturers' Sales Department. D. W. Turnbull has been appointed assistant manager of the Manufacturers' Sales Department.

William B. Flora, sales and administrative executive, has been appointed vice-president, sales, B. F. Goodrich Canada Ltd., it was announced by Ira G. Needles, president.

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Plans Polyethylene Expansion

An expansion program that will virtually double the capacity of E. I. du Pont de Nemours & Co., Inc., for manufacturing "Alathon" polyethylene resin has been announced by Robert L. Hershey, general manager of the company's Polychemicals Department. Plans include modernization of existing facilities and construction of a new manufacturing unit at DuPont's Sabine River Works, Orange, Texas, which has been a leading producer of polyethylene resins since 1948. The new unit is scheduled for completion early in 1958. The modernization program includes expansion of existing facilities at the Sabine plant to permit periodic increases in production, culminating in the start-up of the new unit. The first increase is expected to be complete by late summer.

Mr. Hershey said that a substantial part of the new production will be in two new resins of higher density offered for sale to the plastics industry by DuPont in March. Adequate supplies of these resins are available at present and it is expected that additional production capacity will keep pace with the developing markets for these resins. These new materials, which display a level of crystallinity beyond that available in any previous commercial resin, are "Alathon" 34, designed for film and bottles, and "Alathon" 37, developed for general purpose molding.

All of the increased production announced will be in the field of conventional polyethylenes of intermediate densities ranging up through the 0.930 density of "Alathon" 34 and 37. It does not include higher density linear polyethylene, now under development by DuPont. Mr. Hershey said that DuPont's pilot-plant testing of linear polyethylene was proceeding satisfactorily at the Sabine River Works and that plans for these resins would be announced at a later date.

Expands Line of Adhesives

The production of a new series of resinous base, multi-purpose adhesives, designated as "Tygobond 40, 41 and 45," has been announced by the Adhesives Division, U.S. Stoneware Co., Akron, Ohio. Developed primarily to bond vinyl foam and sponge to themselves, or to vinyl fabrics, metal, wood or composition bases, these air-drying, fast tack type adhesives are crystal clear and non-staining. Tygobond 40 is formulated for spray applications; Tygobond 41 and 45 are easily applied by brush or machine coating. These adhesives require only contact pressure, without heat curing, to produce an exceptionally strong, clear bond that is resistant to water, acids, alkalies, oils and certain solvents. Tygobond may be applied, dried and stored, followed by reactivating the surfaces and assembly of components. The solvent used in Tygobond will not destroy cell structure of the foam. In foam applications, Tygobonds 40 and 41 are recommended to join vinyl or polyurethane sponge and foams to semi-rigid or rigid bases. Tygobond 45 gives a very resilient bond and is used in foam upholstery construction when pieces of the foam must be joined so that the bond line will not telegraph through the overlay material.

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Obituaries

Walter Robbins

Walter Robbins, retired chairman of the board of the General Cable Corp., New York, N. Y., died on July 21 at Lenox Hill Hospital, New York City, after an illness of three weeks. His age was 81. Mr. Robbins retired from General Cable in 1938, after having served as board chairman from 1929. Before that, he had been president for two years. In 1939, he became a business consultant, and in February, 1940, Mr. Robbins joined the British Purchasing Commission as a purchasing agent for metals and chemicals. This service was discontinued in July, 1941, after the Lend-Lease Act was passed. He then served for two months in 1942 as an assistant to the rubber commission headed by Bernard M. Baruch.

Born in Marquette, Mich., Mr. Robbins received a B.S. degree in electrical engineering from the University of Michigan in 1896. Until 1906, he was with the Western Electric Co., in Chicago, and from that year until 1917, he was with the Wagner Electric Co., St. Louis. In 1922 and 1923, he served the Marlin-Rockwell Corp., New York, N. Y., and from 1923 to 1931, he was with Kissel, Kinnicut & Co., New York, investment bankers, becoming a partner in 1927. He is survived by a daughter.

Luther M. Everett

Luther McKinley Everett, owner and chairman of the board of the Better Monkey Grip Co., Dallas, Texas, died July 4 after a long illness. His age was 62. Born in Mountain, Ga., he was one of 11 children. He left school early to help support the family. While still a youth, he began working in the rubber industry with the Diamond Rubber Co. He later joined the Hood Rubber Co. and was sent to Dallas to head its operations there in 1926. When the B. F. Goodrich Co. bought Hood, Mr. Everett stayed on in charge of the Dallas operations. He bought the Better Monkey Grip Co. in 1938, when it was near bankruptcy, and the small venture grew rapidly. It was always wholly owned by Mr. Everett and his three sons. The firm's best known product is tube patches, although it makes a wide variety of rubber accessories for automobiles. Mr. Everett is survived by his wife and three sons.

Clarence Kenyon

Clarence Kenyon, former head of the Vulcan Rubber Products Co. and the Clarence Kenyon Co., both of New York, died on July 10 in Hampton, Va. Mr. Kenyon, a native of Brooklyn, N. Y., had been in declining health since his retirement from active direction of his businesses about three years ago. Mr. Kenyon was a member of the Union League Club of New York. He is survived by his wife.

Emil A. Krannich

Emil A. Krannich, one of the few men ever to build his own tires from crude rubber and ride on them, died July 21 after a long illness. He was 75 years old. Mr. Krannich, who spent nearly 35 years in the rubber industry, began at the B. F. Goodrich Co. in 1899 as a calender man. He was later employed by the Goodyear Tire & Rubber Co. and the Diamond Rubber Co. In 1909, he helped found the L. & M. Rubber Co. at Carlton, Ohio, and, in 1912, helped set up the Knight Tire & Rubber Co. in Canton. During that year, he organized the production of the first pure gum tires made by the Mansfield Tire & Rubber Co. At that plant, Mr. Krannich built four tires from crude rubber, completing all the processes himself. When Mansfield took over the Columbia Tire & Rubber Co., Columbiana, Ohio, he became manager of both plants. For several years, he was with the Twin Tube & Tire Co. at Chicago Heights, Ill., and, in 1922, he returned to Goodrich. Ill health forced his retirement from the industry in 1930, but after six years in Michigan, he returned to Akron to operate a service station. In 1945, he joined the Goodyear Aircraft Corp., and retired for the second time in 1950. Mr. Krannich is survived by his wife and a son.

Malcolm E. Rittenhouse

Malcolm E. Rittenhouse, factory manager of the General Tire & Rubber Co. plant in Port Elizabeth, South Africa, died there June 27 of a heart attack. Mr. Rittenhouse was born in Osgood, Ind., and joined General Tire in 1944 when he opened the South Africa plant as manager. He returned to Akron in 1952 and remained there until April, 1955, when he returned to Port Elizabeth as factory manager. A graduate of the University of Detroit, he was a tool designer with the Packard Motor Co. from 1923 to 1925. Joining Firestone Tire & Rubber Co. in 1927, he was technical manager in Bombay, India, until 1944, when he became affiliated with General Tire. Surviving are his wife, a son and daughter.

Elias D. Cohen

Elias D. Cohen, senior vice-president, director and member of the executive committee of National Starch Products, Inc., New York, N. Y., died July 25 at Mt. Sinai Hospital, New York, N. Y., after a long illness. His age was 74. Mr. Cohen had been with the concern and its predecessors for 55 years, beginning as a salesman with the National Gum and Mica Co. He rose to vice-president and later served as executive vice-president of the National Adhesive Corp. His introduction of starch adhesives was credited with helping the growth of automatic packaging. Mr. Cohen was born in New York and attended New York University Law School.

Ralph E. Hughes

Ralph E. Hughes, a rubber chemist with the Goodyear Tire & Rubber Co., Akron, Ohio, despondent over ill health, jumped to his death July 26 from the seventh floor of the Akron General Hospital. His age was 64. Mr. Hughes, a native of Padi, Penna., had more than 35 years' experience in rubber compounding research, development and customer service. A long-time employe of Goodyear, he returned to Akron about a year and a half ago from Windsor, Vt., where he worked in the Goodyear plant there. He leaves his wife, a son and daughter.

Edward L. Ahern

Edward L. Ahern, manager of the Sales Statistical Department of the Seiberling Rubber Co., Barberton, Ohio, died July 2 after a long illness. He was 57 years old. A member of the Twenty-Five Year Club at Seiberling, where he was employed 30 years, Mr. Ahern was one of the first group of employes hired at the company. He started as a clerk in the Sales Accounting Department, later worked in the Cost Accounting Department and was promoted to the sales statistical managership in 1941. Mr. Ahern leaves his wife and a son.

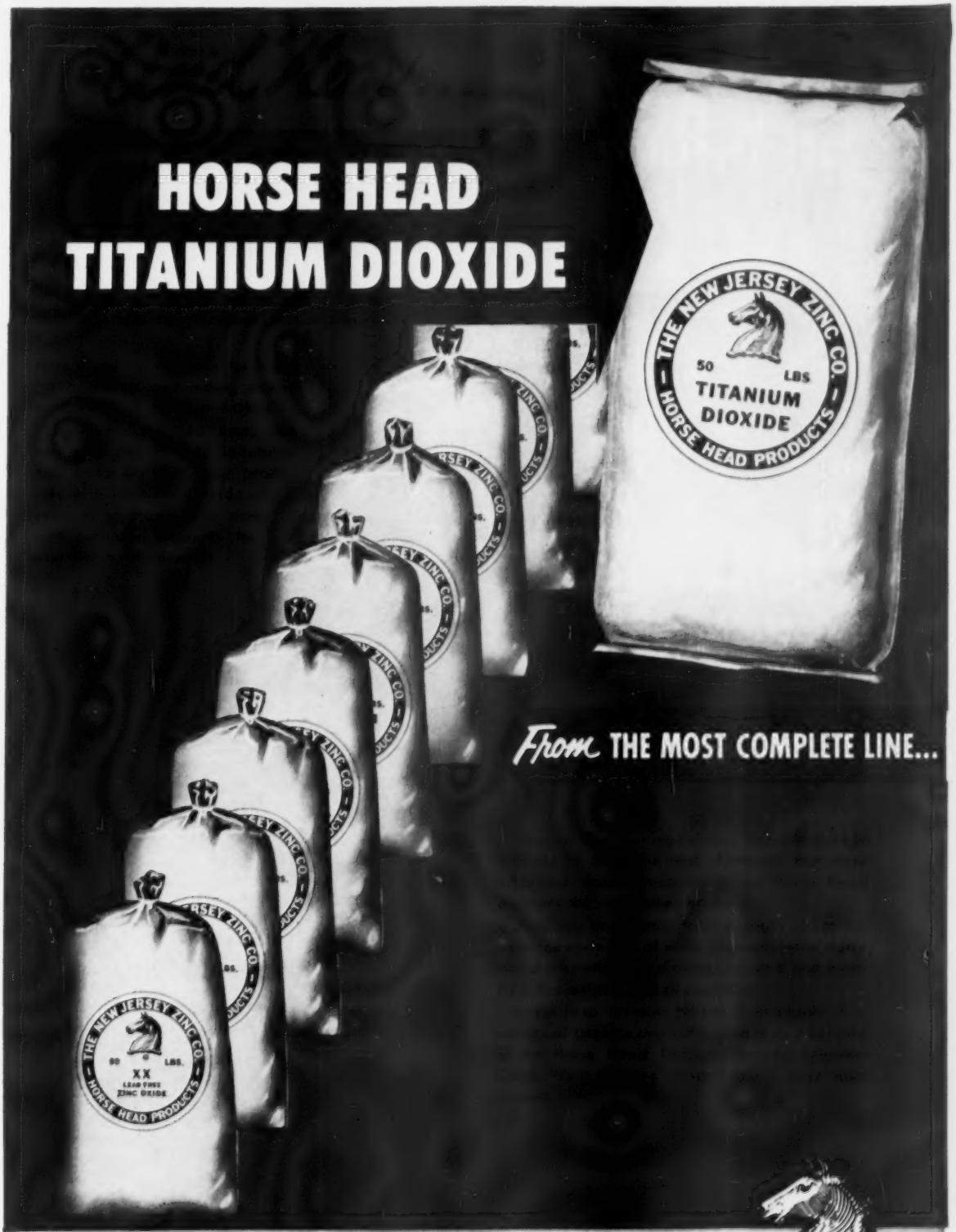
Lester Lower

Lester Lower, factory superintendent of the Enduro Rubber Co., Ravenna, Ohio, died July 18 at his home in Barberton. His age was 55. Mr. Lower was born in Millersburg and was a resident of Akron and Barberton most of his life. A veteran of World War I, he was a member of Firestone Post 3383, Veterans of Foreign Wars. He is survived by his brother and three sisters.

New Firestone Truck Tire

A new truck tire that meets the demands of highway truck operators for a rugged, long-wearing tire at low initial cost has been announced by the Firestone Tire & Rubber Co., Akron, Ohio. "The finest tire in its price field, the Firestone Transport 'A' tire will appeal to the thousands of economy-minded operators of large and small fleets who comprise the mass market for truck tires in America," according to H. D. Tompkins, vice-president in charge of trade sales.

The tire has a five-rib tread built wide and flat to provide increased non-skid safety and mileage. Continuous straight shoulder ribs are scientifically designed and buttressed to guard against uneven wear. A heavy sidewall rib and rugged shoulder design provide extra resistance to scuffing and snagging. High-tensile rayon cord used in the body of the Transport A meets original-equipment specifications and is given added strength and improved adhesion through Firestone's gum-dipping and tension-drying processes. High-quality tread rubber will deliver long, trouble-free mileage. The Transport A is designed for use on front, drive and trailer wheels of highway vehicles. Firestone plants have begun production of this new tire.



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New Goods

Sponge Rubber Biddie Broom

Wells Specialty Co., North Liberty, Ind., is now marketing a sponge rubber broom called the "Biddie Broom", which is designed for use on floors, carpets and other surfaces. The company is also marketing a companion item, the "Biddie Whisk", for clothing, furniture and upholstery. Both units feature a natural sponge rubber pad which is said to be highly durable. The sponge rubber is specially compounded not to flake or chip. In either

item, the sweeping or brushing action of the pad attracts dust, dirt and lint, resulting in a thorough cleaning job. The pad quickly washes clean under a faucet. The Biddie Broom may be used either wet or dry. The sponge rubber pad on both the Biddie Broom and the Biddie Whisk is encased in a polystyrene head which is built to resist impact. The polystyrene heads are available in either turquoise or pink. The sponge rubber pads on both units are grey and the Biddie Broom comes with a color matched handle. Replacement sponge pads are available for both units.

Yale Rubber Oil Seals

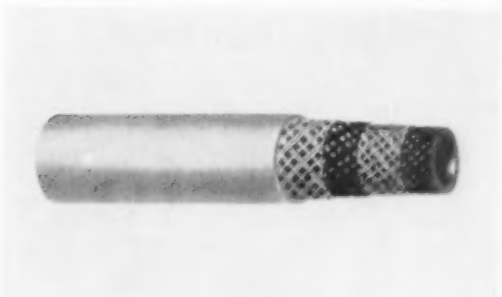
Oil seals, compounded from Chemigum and designed for general use in all moving machinery, are now being manufactured by the Yale Rubber Co., Sandusky, Mich. The new oil seals permit successful application at temperatures up to 250° F. with a wide range of commercial multi-purpose oils, including hydraulic and detergent types and hydrocarbon test fluids, the company states. The new seals have been qualified against SAE specification 110R-SX100-A and B through SX106-A and B and also R.I. Arsenal RJAPD 574, Class 1 through Class 3. Because of simplification of design, satisfactory sealing is accomplished at a reasonable cost. The seal is designed with a positive rubber seal and a single metal part on the outside diameter which provides a safe metal-to-metal press in bore. In use, oil pressure helps form the seal by exerting force on the inside diameter of the seal. A deep, molded-in spring groove is located on the inside diameter to make it safer than the usual expensive spring guard. The new seals are available in standard sizes and can be revised at low cost to meet special conditions.

Pocket-Sized Manual Respirator

A pocket-size manual respirator, "Revivator," has been made available by Gottlieb Weinmann, Abteilung medizinischer Apparate, Ludwigshafen am Rhein 1, West Germany. The device can act as a simple pulmotor in an emergency, pumping air into the lungs with greater efficiency than ordinary artificial respiration, according to the manufacturer. As shown above, the respirator operates by means of a simple rubber bellows connected to a face mask. A system of valves allows only fresh air to enter the lungs and prevents unsafe pressures. The respirator can also be attached to a portable oxygen supply when a more concentrated source of oxygen is required.

"Duraprene" Air Hose

"Duraprene" is the newest addition to the complete line of air hose produced by the Hamilton Rubber Manufacturing Corp., Prince and Meade Streets, Trenton, N. J. A light-weight, two-braid hose, Duraprene is constructed to meet the company's rigid specifications of "oil resistant" and is thus applicable to a wide range of industrial uses where air pressures of up to 200 pounds psi are encountered. The new red hose is presently available in sizes up to and including ⅜ inch, the company advises.



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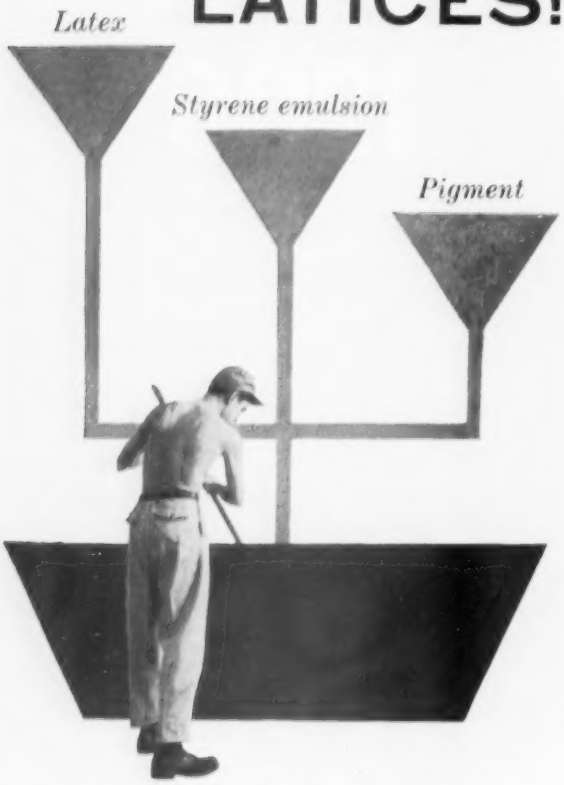

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Compounding is simplified when you modify synthetic or natural rubber latices with Monsanto's specially formulated styrene emulsions. The fine particle size allows combination of the emulsion with the latex when pigments and fillers are added. No extra mixing step is required.

Pre-selected ratios can be controlled exactly—from high-rubber low-styrene to low-rubber high-styrene. Recommended for modifying flexibility characteristics of latex compounds used in manufacturing baby pants, girdles, surgical gloves, upholstery fabrics, rug underlays, adhesives, raincoats, foam rubber and many other products.

Prices and supplies of Monsanto's styrene emulsions are stable. Write today for data sheets and laboratory samples. Monsanto Chemical Company, Plastics Division, Room 951, Springfield 2, Mass.

MONSANTO

Polyethylene Disposal Can

A versatile new step-on disposal can, combining the advantages of being silent, non-breakable, sanitary and colorful, has been introduced by Dapol Plastics, Inc., 90 Grove Street, Worcester, Mass. Made of Bakelite polyethylene, the can is light in weight, easy to clean, and its soft resilient surface will not mar adjacent furniture or floors. The sanitary liner of the "Dapolite Step-On Can"

has an eight-quart capacity. Pedal-operated lid, liner and outer can together weigh about three and one half pounds, and the unit is about 12 inches high. The outer can is available in red, yellow, turquoise, blue or pink; the cover is white, and the liner is a frosted polyethylene. In addititon, the watertight, easy-to-rinse out liner will hold 10 baby diapers. A quick cleaning in hot water with soap or detergent is all the maintenance that is necessary. The resilient can does not dent or rust. Annoying leaks are also eliminated by making the liner all in one piece without seams.

Unicellular Rubber Floats

Floats of hard unicellular rubber sponge, fabricated to customer specification, are now being produced by the Rubber Products Division of the Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, Ohio. The new material of minute sealed-cell structure is lighter than cork, will withstand higher temperatures, is resistant to fungus growth, needs no protective coating, maintains stable weight and volume, and is not subject to waterlogging, Parker states. In contrast to metal floats, the new material will not fail because of vibration conditions or punctures. It can be drilled or otherwise machined and can be molded to shape with or without a metal mounting arm. The float has a specific gravity of 0.14. Testing by the Parker Rubber Research and Development Laboratory indicates the material is suitable for use in water, oil, gasoline including aviation fuels, and various other liquids, over a wide temperature range.

Translucent Tarpaulin Fabric

A new fabric for tarpaulins and similar protective coverings, combining translucency with high strength, low weight, weather resistance and other advantages, has been introduced by Herculite Protective Fabrics, Inc., 140 Little Street, Belleville, N. J. The new material is made of loose mesh weave Fortisan-36 laminated between two outer Krene coatings. The vinyl-laminated

Fortisan-36 fabric offers greater strength and dimensional stability than natural fibers and is resistant to the sunlight degradation that attacks fabrics made with certain other fibers, according to the company. Among initial industrial uses foreseen for the tarpaulin-type fabric are linesmen's tents, hatch covers, portable repair shelters and numerous other coverings that permit light transmission while providing weather protection for various production, repair and maintenance operations.

"Rubber Scrubber" Kitchen Aid

Rubber Scrubber Corp., Sewall Island, Watertown, N. Y., has developed a kitchen scouring aid that also finds use in industry. Made of a block of foam rubber with carborundum grit on one side, it has already been in use in potteries and mold shops to remove burrs. The pat-

ented scouring pad relies upon a DuPont-developed adhesive applied in such a manner that, when used dry, a water rinse will rid the pad of accumulated material. The pads may be used wet or dry to finish pottery ware ranging from leather hard to completely dry. Pads come with a range of six degrees of grit size.

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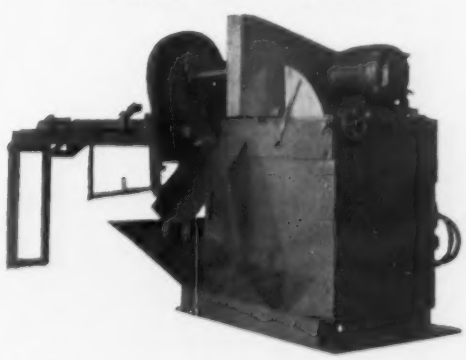

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New Equipment

Drape-Flex Stiffness Tester

How a material drapes under its own weight and how stiff it feels when flexed can be determined by the Drape-Flex Stiffness Tester, manufactured by Fabric Development Tests, P.O. Box 45, Brooklyn 32, N. Y. Developed for the U. S. Navy Clothing Supply Office, the tester can be used in testing plastic film, coated and resin-treated fabrics, sized fabrics, felt, and non-woven textiles. The instrument consists essentially of a hollow

rectangular stand with a cut-out sloped end, a graduated scale running lengthwise of the top horizontal surface of the stand, and a specimen holder designed to move freely along the top surface and over the sloped end. The scale is mounted in front of the movable holder and is inclined for easy reading. A standard 6 x 1 inch die-cut specimen is used for most tests.

In operation, the stand is first supported in a horizontal position. Specimens are die-cut with the test direction in the length. The movable specimen holder is picked up by the hand grip, the side spring clamp depressor control pin is pushed in until the clamp is locked in the open position, one end of the specimen is placed under the clamp coincident with the reference mark on the holder, and the control pin is then pushed back to close the clamp. The specimen holder, with the specimen mounted test side up, is then placed on the top surface on the stand and moved forward until the free end of the specimen drops down under its own weight to the level of the standard slope. The length of overhang of the specimen is read directly from the fixed scale opposite the reference mark on the movable holder.

Drape stiffness is one-half of the average measured length of overhang of the material. Flex stiffness is calculated by multiplying drape stiffness cubed and fabric weight. The tester is said to conform to the requirements of ASTM D-1388-55T for testing the stiffness of fabrics.

Bowser Technical Refrigeration Co., Terryville, Conn., has announced the introduction of a line of **CS circulating lubrication systems** for providing continuous re-circulation of filtered oil to bearing surfaces of light, medium and heavy-duty machinery. The units are said to find application in rubber, textile, and associated industries.

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for more current per circuit... more power per dollar

Anaconda specifies Enjay Butyl insulation for high-voltage cables because this rubber has incredible resistance to ozone. Surpassing the industry's standard three-hour specification test, Enjay Butyl insulation used by Anaconda showed *no injury after 72 hours* of ozone concentration tests—24 times longer than specification requirements. Other rubbers would deteriorate and crack in a fraction of this time.

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Perhaps *your* product, too, can be improved with versatile Enjay Butyl. It comes in non-staining grades for white and light-colored parts, offers excellent electrical properties, low price and *immediate availability.* For full information, contact the Enjay Company. Complete laboratory facilities and technical assistance are at your service.

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Pumping Progress Report

FOR MECHANICAL ENGINEERS

An advertisement prepared by The Aldrich Pump Co., Member of Hydraulic Institute, U.S.A.

SPACE, in many pump installations, is a major problem. Another is the necessity for special foundations. For new installations these factors may dictate elaborate construction; for replacement or modifications of existing systems, expensive piping and equipment changes.

COMPACTNESS OF DESIGN, while often desirable, is not necessarily the answer. Simplicity of design may be a better solution.

SIMPLICITY OF DESIGN brought about the first Inverted Triplex and Quintuplex and ultimately Septuplex and Nonuplex Pumps. This Aldrich design innovation brought to users economies of space, maintenance and operation they had never known. And even more important, Multiplex pumps brought new freedom from pulsation.

INVERTED PUMP DESIGN permits the use of less expensive foundations. With the crankshaft located near the floor there is no need to raise the driver or lower the pump. Then, too, inverted pumps require fewer square feet of floor space than conventional pumps.

MAINTENANCE COSTS ARE REDUCED. Fluid-end, where most work is done, is at chest level. Sectionalization, another Aldrich innovation, and parts standardization permit ease and economy of inspection or replacement.

TELL US ABOUT YOUR PUMPING PROBLEM. The chances are that one of our standard pumps — or a modification – will do your job. Detail your problem and we'll send you our Data Sheet describing the Direct Flow Pump we recommend. Write to: The Aldrich Pump Company, 25 Gordon Street, Allentown, Pa.

Mast Model 650-2 Rubber Hardness Tester

Having an operating range from —70° to 250° F., a new rubber hardness tester, called the Model 650-2 Material Laboratory Indentometer, has been announced by the Mast Development Co., Inc., 2212 East 12th St., Davenport, Iowa. The instrument is a versatile dead weight hardness tester which utilizes the known relationships among penetration, hardness, and Youngs modulus for a perfectly elastic isotropic material. Measuring 13¼ x 5¾ x 4¾ inches, the apparatus consists of an

upright casting that supports two separable dead weights. Upon the casting are mounted a dial indicator, an eight-volt electrical buzzer, a platen (sample mounting plate) with knobs for raising, lowering, and locking the platen, and omni-directional spirit level, and leveling jacks. Alternate indentor tip assemblies are provided to enable changeover from one method of test to another in less than one minute.

In the operation of the instrument, the test specimen is mounted upon the platen. The platen is vertically adjusted until contact is established between specimen and indentor tip. The pre-load handle is then turned until the dial indicator has completed ten turns. The dead weight is dropped down and the dial is read out directly in millimeters of penetration. Prior to test, the instrument can be levelled by adjusting the tripod feet; an omni-directional level indicator is mounted on the base. During the test the eight-volt buzzer supplies vibration to eliminate errors due to friction.

The Model 650-2 was designed in cooperation with the Material Laboratory to fulfill the requirements of the Admiralty hardness test used by the Navy Bureau of Ships, Army Engineers, and Army Ordnance; the Modified Admiralty hardness test required by Federal Specification ZZ-R-601, and the new hardness test recommended by the International Organization for Standardization. According to the company, the instrument is provided complete with graphs for conversions to Shore A, British Standard Degrees, and International Hardness Degrees.

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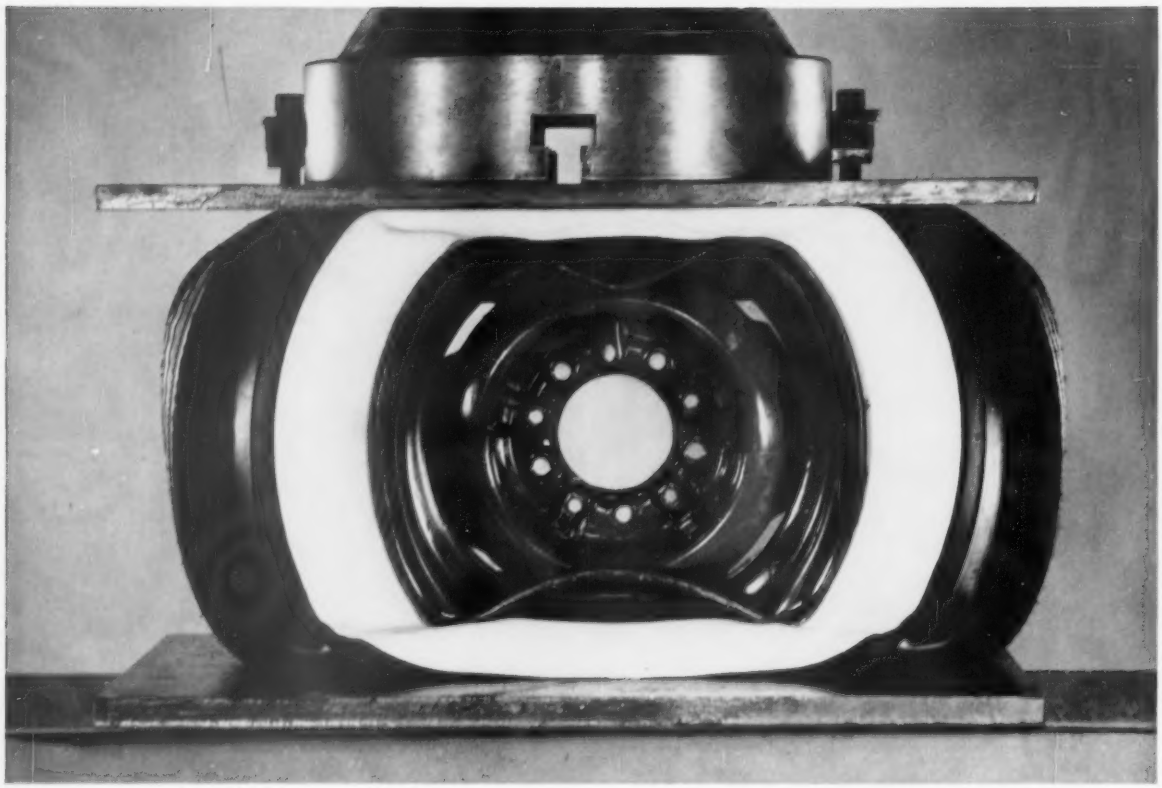

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Ball & Jewell Plastics Grinder

Ball & Jewell, Inc., 24 Franklin St., Brooklyn, N. Y., has announced production of the third in its series of Marvel Line granulators. The M-300, as the machine is designated, is the largest in this series of all-steel plastic grinders. The machine is said to provide a grinding capacity of up to 400 pounds an hour,

including elastomerics such as vinyl and polyethylene. The double shear knife action is said to assure cutting and grinding without fluffing. According to the company, hot and cold sprues can be fed simultaneously. The 8 x 16 inch throat opening accommodates large area rejects as well as sprues and runners. Specially designed hand clamps are said to assure positive locking of the hopper to the machine, yet it can be detached in seconds, exposing the entire interior of the machine for quick, easy cleaning. The material is granulated into a bin, with a large sight glass to show the operator when it is filled. The unit is available with either a 7½ or 10 hp motor.

Tracerlab Production Analyzer

A new production analyzer, designed to give a continuous record of production for rubber, plastics and other sheet materials, has been announced by Tracerlab, Inc., 130 High St., Boston 10, Mass. The analyzer is said to give an up-to-the-minute record of production for the shift, day, or the run of material. The information relayed by the machine is immediately available and requires no computations to be made from chart records. The machine divides production into five categories: (1) production within tolerances, (2) production between tolerance and 10% over tolerance, (3) production between tolerance and 10% under tolerance, (4) all other production over 10%, and (5) all other production under 10%.

Especially designed for dicing plastic sheet, a **42-inch capacity cutter** has been introduced by Taylor, Stiles & Co., Bridge St., Riegelsville,, N. J. Called the Little Giant Dicing Cutter, the new unit is said to operate efficiently at relatively rapid speed.

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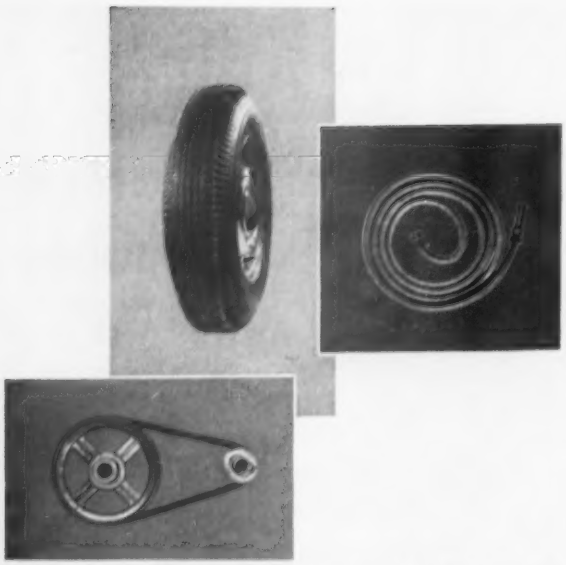

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NEW LINE OF SYNVAR BONDING RESINS SOLVES LATEX DIP PROBLEMS IN TIRE AND RUBBER COATING INDUSTRIES.

■ SYNVAR can solve many of those adhesion problems constantly arising in the manufacture of rubber-fabric products. Take latex dip solutions, for example. Straight resorcinol-formaldehyde (R-F) solutions, added to the dip to improve adhesion, are usable for only 24 hours. Short life of such bonding agents results in a waste of money and time. Synvar bonding resins give latex solutions longer working life; eliminate gelling of dips.

■ SYNVAREN PLS-R is a *stopped* R-F resin that in itself is stable for a year, and for two months or more in a prepared latex dip. It fully replaces R-F solutions, giving adhesions equal to freshly prepared R-F in latex dips. SYNVAREN PLS-R is compatible with a variety of latices, is non-corrosive, and eliminates the need for handling irritating chemicals.

■ SYNVAREN 631 and SYNVARITE BRLD, the phenol-formaldehyde bonding resins for latex dips, have excellent stability. These resins give somewhat lower specific adhesion than SYNVAREN PLS-R, and are considerably lower in cost. Either resin can be used alone or in combination with SYNVAREN PLS-R to obtain balanced physical properties.

■ SYNVAR bonding resins improve the quality of your tires, belt drives, or coated fabrics. Write for SYNVAR specification bulletin No. 300 and information on complete line of rubber compounding resins.

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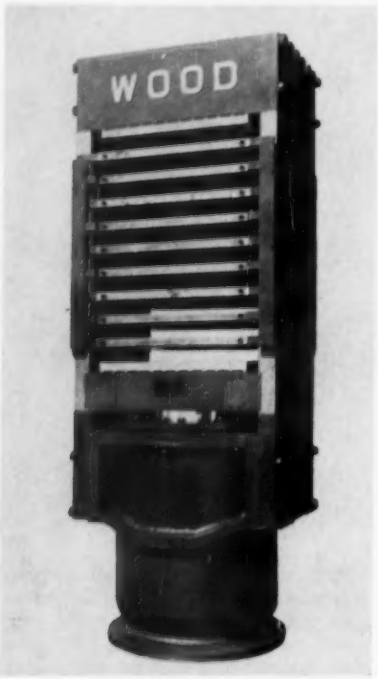
Wood Multiple Opening Press

R. D. Wood Co., Public Ledger Building, Philadelphia 5, Penna., has announced the availability of a new ten-opening, 1100-ton, hydraulic platen press for the production of molded cellular rubber products. This



1100-ton capacity press, having a platen size of 42 inches by 42 inches by 2½ inches, can also be used for general purpose rubber processing operations such as curing slab stock and producing floor tile. The machine is elevator fed and can be used with an accumulator system or a self-contained pumping unit. Its over-all dimensions are as follows: height, 14 feet; width, 5 feet; depth, from front to back, 4 feet.

Philadelphia High Pressure Pumps

A new series of high pressure, reciprocating plunger pumps for pressures up to 50,000 psi has been announced by the Philadelphia Pump and Machinery Co., 1513 Race St., Philadelphia, Penna. The chemical proportioning pumps are suitable for free-flowing, viscous, tarry materials and slurries as well as acids, alkalies, salts, oxidizing and reducing agents. They are of the controlled capacity types and are suitable for accurately metering output from a minimum of 2 cc per hour to a maximum of 15,000 gph. They are available in simplex, triplex and quadruplex types.

A new **tension meter** to safely measure tensions up to 20 pounds during the processing of wires, cables, coils, cords and other filamenteous materials has been announced by Tensitron, Inc., Harvard, Mass. The lever-operated meter is approximately 8 inches high, 6 inches wide and has a depth of 2½ inches. The legible dial is 3½ inches in diameter.

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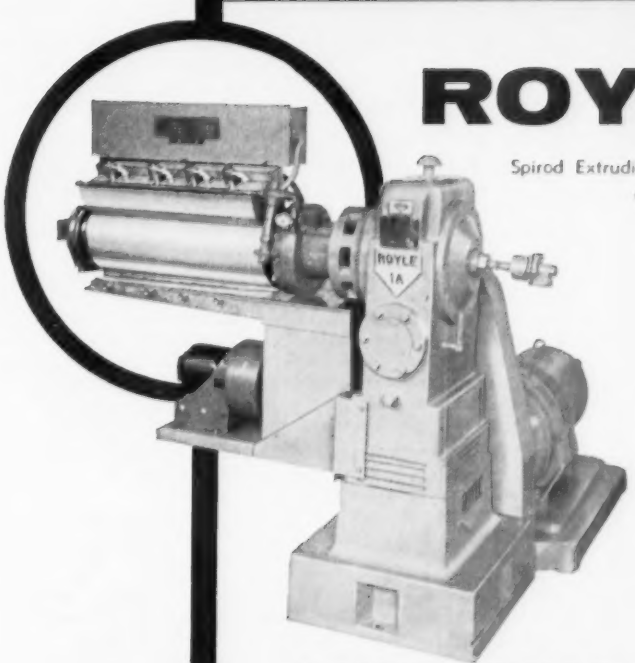

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Reviews

BOOKS

1955 Book of ASTM Standards — Part 6: Rubber and Plastics, Electrical Insulation, Electronic Materials. 6 x 9¼ in. 1784 pp. $13.00. **Part 7: Adhesives, Textiles, Soap, Water, Paper, and Shipping Containers.** 6 x 9¼ in. 1700 pp. $11.00. American Society for Testing Materials Headquarters, 1916 Race Street, Philadelphia 3, Penna.

The American Society for Testing Materials has completed and published its largest triennial "Book of ASTM Standards." The 1955 edition has over 11,000 pages and includes more than 2,150 standard specifications, tests, and definitions for materials. The book is issued in seven parts, each pertaining to a particular area or group of areas of materials. Each part is complete with a detailed subject index and a list of standards in numeric sequence. To keep the book up to date, supplements will be issued to each part late in 1956 and in 1957.

Part 6 includes 300 standards, 148 of which are new or revised since 1952. The following subjects are included: Rubber Products(fire hose, belting, gloves, wire and cable, cements, sponge rubber, hard rubber, brake hose, blankets, tests); Electrical Insulating Materials (varnishes, tubing, tapes, oils, askarels, porcelain, paper, mica, molded materials, tests); Materials for Electron Tubes, Electronic Devices and Lamps, and Plastics.

Part 7 contains 354 standards, 166 of which are new or have been revised since 1952. The following subjects are included: Adhesives; Textile Materials (cotton, wool, glass fabrics, hosiery stretch, testing); Atmospheric sampling; Water; Paper and Paper Products; Soaps and Other Detergents; Shipping Containers.

•

Bibliographical Abstracts on Redeposition of Soil on Cotton Fabric. (Special Technical Publication No. 173). Published by the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Penna. 6 x 9 in. 36 pp. $1.00.

This booklet contains a review of the literature on the theory and practice of redeposition methods which was presented at a meeting of ASTM Committee D-12 on Soaps and Other Detergents, March 15, 1955. The review is a consolidation of the more pertinent information developed in the preparation of the bibliography which follows. The bibliography itself contains 171 entries covering the period 1909 to 1953. References are numbered consecutively and are listed by year and author. Abstracts in many cases were prepared from the original article and are slanted toward giving an indication of the contents that are pertinent to testing methods and theories.

•

Manual of Excellent Managements: 1956. Published by the American Institute of Management, 125 East 38th St., New York 16, N. Y. 8½ x 11 in. 100 pp. $20.00.

Designed to improve management throughout the country and to provide investors with an objective foundation on which to base their investment decisions, this book contains a list of those companies whose management practices are worthy of a rating of excellent as determined by a study conducted by the American Institute of Management. Included is information concerning excellently managed American and Canadian companies in all branches of business. Each company entry contains the principal and secondary products or services of the company, the location of its executive offices, the number of its employees and stockowners, the names and positions of the principal executives, its financial auditors, the rating of the company within the excellently managed group, and the length of time the company has sustained its designation as excellently managed.

BOOKLETS, CATALOGS, etc.

Manual of Rubber Planting Companies: 1956. Published by Zorn & Leigh-Hunt, 3 & 4 Great Winchester St., London E. C. 2, England. 5¾ x 8½ in. 432 pp. (For private circulation).

Listing the major British natural rubber planting companies throughout the world, this manual gives information on each company's working capital, its officers, the total area of land the company has under cultivation and the yield per acre of each company's plantings, which yield is calculated over the whole of the mature rubber area, whether tapped or not. Wherever possible, the book classifies the rubber areas as between original unselected seedling and pedigree stock. The estate cost, as used in the manual, covers all charges directly attributable to crop production and manufacture, maintenance of the mature areas and also export duty and levies where known. The figures do not include the cost of replanting, maintenance of immature areas, depreciation or any expenditure incurred outside the country where the particular company is located. Also included in the manual is a separate list of the directors and secretaries of the various companies.

•

Water-Vapor Refrigeration with Steam-Jet Coolers. Ingersoll-Rand, 11 Broadway, New York 4, N. Y. 8½ x 11 in. 24 pp.

Included in this bulletin are a series of diagrammatic illustrations in color to show how typical Steam-Jet Coolers operate. A listing of the range of sizes available as well as approximate dimensions of the units are given. A complete description of the various component parts and auxiliaries is included. Of special note is the section on automatic controls. Three pages of installation photos show the range of applications and the adaptability of this equipment to suit varying installation requirements. The bulletin points out that the units may be used in such segments of the rubber industry as tire plants, synthetic rubber plants and other rubber processing installations.

•

Automation Gaging Systems and Standardized Control Units. (Catalog No. 56 AM). Federal Products Corp., 1144 Eddy St., Providence 1, R. I. 8½ x 11 in. 28 pp.

The four gaging systems used for automatic control, electric, air-electric, electronic, and air electronic, are described in this booklet with respect to the components that make up each system. In addition, the various types of control gaging for automation, such as on-the-machine, after-the-machine, continuous process, and several others are described and illustrated. Some of the more advanced types of gaging control such as differential measurement, and non-reference variation are also described. One of the newest techniques that is explained is called combined gaging which utilizes both after-the-machine and on-the-machine gages.

•

Tergitol Surface Active Agents. Carbide & Carbon Chemicals Div., Union Carbide & Carbon Corp., 30 East 42nd St., New York 17, N. Y. 8½ x 11 in. 40 pp.

The company's line of surface active agents, including seven noniomics and four anionics, are described in this bulletin. Besides the information on physical properties, shipping data, and specifications, performance data are included on wetting, penetrating, cleaning, and sudsing action, and lime soap dispersing power. Test methods used in obtaining performance data and specifications are given. In addition, there are many suggested formulations as guides to the use of these surface active agents in detergents and cleaners, latex paints, agricultural concentrates, metal polishes, and specialty products.

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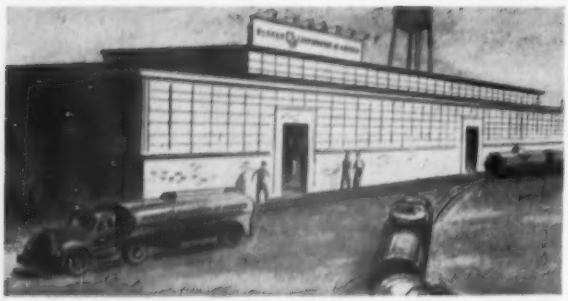

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- Plasticizers

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REVIEWS (CONT'D)

ETL Services and Facilities. Electrical Testing Laboratories, Inc., 2 East End Ave., New York 21, N. Y. 8½ x 11 in. 72 pp.

This bulletin contains more than 70 photographs and covers typical measurements and determinations made on hundreds of products and materials by the company. In addition, it catalogs laboratory equipment available for limitless assignments in the fields of testing, applied research, and engineering analysis. This information is subdivided into the areas of chemical, electrical, electronic, mechanical and physical, and photometric, radiometric, and calorimetric testing. Also covered in the bulletin is information on such special services as inplant checks of instruments, audits of specification compliance procedure, and inspection and witness testing of wire, cable, transformers, generators, etc.

•

Nadone (Cyclohexanone). (Technical Bulletin No. I-19). National Aniline Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y. 8½ x 11 in. 32 pp.

This technical bulletin contains seventeen pages describing the physical and chemical properties of Nadone (Cyclohexanone). The bulletin also describes and illustrates all the principal reactions of this unusual solvent and chemical intermediate. It also provides seven pages of suggested uses in such applications as a rubber-base composition, adhesives, vinyl compositions, plasticizers, synthetic resins and paint removers. Appended is a comprehensive bibliography of 178 literature references.

•

Worthington Variable Speed Drives. (Bulletin No. 1600-B7P). Worthington Corp., Harrison, N. J. 8½ x 11 in. 16 pp.

This bulletin contains information about features, operating principle, design and component parts of the company's line of variable speed drives. Included are definitions of engineering terms and formulas as well as selection tables for choosing the right drive. Graphic illustrations point out the various dimensions of the units. Complete information about modifications and accessories as well as pictorial illustrations of various drive applications are included.

•

101 Atomic Terms and What They Mean. Esso Research and Engineering Co., 15 West 51st St., New York 19, N. Y. 8 x 5 in. 24 pp.

Contained in this booklet are frequently used terms found in the field of atomic energy. Illustrations and drawings help clarify some of the terms being explained. Such words and terms as pitchblende, photon, Van de Graaff accelerator, roentgen, pair production, heavy water, deutron and Cobalt-60 are a few of the 101 terms defined in the booklet. Interesting slang terms, like cutie-pie, pig and coffin, are also defined.

•

Sturtevant Dry Processing Equipment. Sturtevant Mill Co., Park & Clayton Sts., Boston 22, Mass. 8¼ x 10¾ in. 8 pp.

Specifications and photos of crushers, grinders, pulverizers, micron-grinders, separators, granulators, blenders, mixers, feeders, screens, elevators, conveyors, mechanical dens and excavators are included in this catalog. The brochure deals mainly with production equipment but details of laboratory units are included as well. Also included is a discussion of the company's "Cooperative Engineering Plan."

•

Dravo Process Equipment. (Bulletin No. 236). Dravo Corp., Neville Island, Pittsburgh 25, Penna. 8½ x 11 in. 4 pp.

Large scale and special purpose process equipment for the rubber, plastic, chemical and allied industries is described in this brochure. Design and construction details are given for intensive mixers, liquid blenders, dissolvers, kneading machines, pressure filters, ball mills, conical blenders, horizontal blenders, quick-opening doors, etc.

1956 Directory of New York Importers. Published by the Commerce and Industry Association of New York, Inc., 99 Church St., New York 7, N. Y. 6 x 9 in. 244 pp.

Included in this compendium is an alphabetical list of New York City importers. The list includes each firm's name and address, postal zone number, telephone number, cable address, date of establishment, bank reference, the particular products which that firm imports, special brand names handled by such firm, and the principal countries from which such products are imported. The book is designed to serve a two-fold purpose—to encourage imports from the many important overseas markets, and to promote the sale and distribution of imported goods in the United States. Also included is a classified list of importers as well as a brand names index.

•

Neoprene Type WX. (Report No. 56-1). Elastomers Division, E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del. 6½ x 9½ in. 12 pp.

In this report the physical properties of Neoprene Type WX and its vulcanizates are outlined and detailed information on crystallization effects relative to other types of neoprene is given. Included are the results of studies made on the raw polymer, uncured compounds and on vulcanizates. Measurements used to detect changes associated with crystallization include durometer hardness, dilatometric volume change, Young's modulus, and compression set at subnormal temperature. Complete test data of change in volume at various time intervals for Types W, GN, and WX, uncured and cured, are included. The calculation to half crystallization time is also given.

•

AMF Standard and Simplified Drafting Practices. American Machine & Foundry Co., 261 Madison Ave., New York 16, N. Y. 8½ x 11 in. 60 pp.

The first section of this publication contains the contents of a speech delivered by the company's standard administrator before the American Society for Engineering Education. The remaining pages are devoted to details of the company's standards on drafting room practice and simplified drafting. The ASEE speech quotes the results of a comparative test made at the company's Buffalo plant between standard and simplified drafting practices. The section on traditional and simplified drafting procedures shows how the company has put simplified drafting to use. Eleven rules for simplified drafting with examples to point up each rule are also given.

•

Vygen 2201: Modified Rigid PVC Compound for Calendering Rigid Thermoplastic Postformable Sheets. Chemical Division, General Tire & Rubber Co., Akron, Ohio. 8½ x 11 in. 20 pp.

Contained in this bulletin are complete technical and processing data on Vygen 2201 compound. Recommended power requirements for mills, Banburys, and calenders used in processing the material are given, as well as recommendations for mixing, calendering post-forming and embossing. Such physical properties of the material as tensile strength, flexural strength, flexural modulus and heat distortion are included. A comparison of the chemical resistance of the material with a type II rigid PVC compound and a nitrile gum compound is also given.

•

Alnor Precision Instruments for Industry. Illinois Testing Laboratories, Inc., 420 North La Salle St., Chicago 10, Ill. 8¼ x 11 in. 8 pp.

Described in this bulletin are the company's line of pyrometers, thermometers, thermocouples, air velocity meters, and dewpoint indicators. A brief description of each instrument is given with respect to its application, physical makeup and accuracy. In addition, a bulletin number is given at the end of each description which refers the reader to more concise engineering data on the particular instrument.

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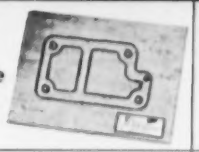
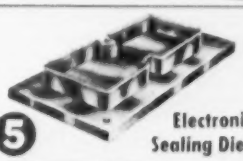
For Cutting Rubber, Neoprene, Plastics, etc. Sheeting, Foam, Sponge, Cellular, Cured & Uncured Gang Dies Our Specialty

3 Mallet Handle Dies

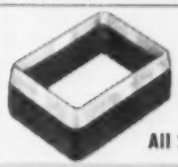


4 Steel Rule Cutting Dies

2 Steel Rule Clicker Dies



5 Electronic Sealing Dies



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- We train your personnel in these modern plants . . . help you establish the latest formulae for processing natural and all new types of synthetic rubbers and textiles . . . latest "Know-How" in Tubeless Tires, Butyl Tubes, Rayon and Nylon Cords, Carbon Blacks. We also design factories and supervise machinery installations if desired. Write: International Technical Assistance Division, Dayton Rubber Co., Dayton 1, Ohio.

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Dayton Rubber 51 YEARS OF PROGRESS

MARKET REPORTS

TRENDS
NEWS
PRICES

NEW YORK, JULY 31, 1956

Natural Rubber

Since our last report (June 29), the price of spot rubber on the New York Commodity Exchange has moved in a range of 350 points, high for the period being 36.25c reached on July 31, and low being 32.75c reached on July 7. The average price of spot rubber for the month of July was 33.91c based on 21 trading days, compared with 30.54c in June.

Even though the market responds quite readily to short covering influenced by the situation in the Middle East, there is an inclination in the trade to look upon the skyrocketing price structure with a great deal of suspicion. It is generally conceded that developments in connection with the Suez Canal will be the dominating factor in shaping sentiment. Few, however, are inclined to accept the theory that untoward developments will be the outcome of pending negotiations and, consequently, the disposition is to stay on the sidelines.

It is strongly argued in various quarters that the price of natural rubber has again risen to a level that will permit increased exports of synthetic rubber. While production of GR-S types was off sharply during the month of June, this is expected to be purely transitory.

U. S. consumers need natural rubber for the last quarter of this year and beyond, but manufacturers show no willingness to follow the price advances which, it is said, are not reflecting fundamentals. This impression is reflected, in no small measure, by the active trading in the futures market with wide price swings and limited operations in actuals.

Indonesian Duty Removal

Commercial sources in Jakarta advise that the Indonesian Government has decided to lift export duties on rubber. An Economic Ministry spokesman said that the Government is considering a number of measures to help overcome the country's current raw materials export slump which is causing a drain on its gold and foreign exchange reserves.

Meanwhile, Indonesia has decided to follow the lead of Malaya and Singapore and sell rubber to Red China. How much is still in question. The Indonesian Foreign Ministry announced the abandonment of the rubber ban in the strategic goods embargo voted against Peiping by the United Nations General Assembly as a Korean War measure five years ago.

This means that, altogether, Asiatic producers of 1,000,000 tons of natural rubber a year—about two-thirds of the world's supply—now have a potential market in Red China. Most of the 1,000,000 tons comes out of Malaya and Singapore, whose abandonment of the embargo was disclosed by the British early in June. The Chinese Communists have been largely dependent on trans-shipped supplies from the Soviet bloc, for which Western trade lists are less strict, and a rubber-for-rice deal with Ceylon, a British Commonwealth nation.

Indonesia's rubber industry, which produces more than 300,000 tons a year, has been troubled by price fluctuations attributed to both the embargo and to Western production of synthetic rubber.

Price Data

Closing Rubber Prices on New York Commodity Exchange (No. 1 R.S.S. Contract)

FROM JUNE 30 TO JULY 31

June	Spot	July	Sept.	Dec.	Sales
30	....	....	....	....	...
July					
1	....	....	....	....	...
2	32.75	33.00	30.45	28.90	99
3	33.25	33.85	31.50	29.60	156
4	....	....	....	....	...
5	33.75	34.40	32.30	30.20	156
6	33.61	34.40	32.30	30.00	164
7	....	....	....	....	...
8	....	....	....	....	...
9	33.25	33.94	32.00	29.70	162
10	33.75	34.30	33.20	30.75	422
11	34.50	35.25	33.90	32.20	318
12	34.00	34.50	33.35	31.30	175
13	33.00	33.25	32.15	30.30	183
14	....	....	....	....	...
15	....	....	....	....	...
16	34.00	34.25	32.85	30.85	76
17	33.50	34.25	32.90	30.80	139
18	33.75	34.75	33.05	31.00	125
19	33.50	34.50	32.75	30.74	98
20	33.00	34.50	31.95	30.05	213
21	....	....	....	....	...
22	....	....	....	....	...
23	33.25	34.00	32.25	30.35	119
24	33.50	35.50	32.21	30.50	155
25	34.25	36.25	32.80	31.00	110
26	35.00	37.90	33.95	32.05	256
27	34.50	42.00	35.00	32.79	303
28	....	....	....	....	...
29	....	....	....	....	...
30	35.75	....	36.30	33.35	209
31	36.25	....	37.15	34.20	315

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.36¼
August	.35½
September	.35
Thin Latex Crepe:	
Spot	.43
Thin Brown Crepe, No. 2	.30
Flat Bark Crepe	.22¼

London Market
(Standard Smoked Sheets)

Oct.-Dec.	34.64 - 34.79
Jan.-Mar.	33.34 - 33.48

Singapore Market
(Standard Smoked Sheets)

Sept.	31.42 - 31.53

Middling Upland Quotations

	June 29	July 31		
	Close	High	Low	Close
Oct.	32.68	32.51	32.37	32.46
Dec.	32.74	32.65	32.53	32.62
Mar.	32.77	32.67	32.52	32.63

Notes and Quotes

On his return to the United States after an inspection tour of his company's facilities, Harvey S. Firestone, Jr., chairman of the Firestone Tire & Rubber Co., stated that business conditions in Europe today are better than they have been at any time since the end of the Second World War. "One of the most encouraging developments in Europe today is the increasing use of techniques to create new markets and to expand existing markets in the manner we in the United States have employed for some time. This is being accomplished in Europe through increased and more intensive research programs and improvements in productivity." Mr. Firestone observed that through research new products are being developed and old products are being improved.

Synthetic Rubber

According to W. S. Richardson, president of the B. F. Goodrich Co., the United States today has sufficient quantities of all types of synthetic rubber to supply domestic needs for this material. "Increasing availability of man-made rubbers has increased world inventories about 55,000 tons during the past twelve months. Further increases are expected by the year end in inventories of both crude and man-made rubbers, in addition to accumulations that may occur in Russia and China over actual consumption in those nations," Mr. Richardson said.

"During the first half of this year, the United States consumed approximately 747,000 long tons of new rubber, about 27,000 tons less than during the first six months of 1955.

Synthetic Consumption Increases

"Consumption of man-made rubber during the first half of this year increased to 453,000 tons, up 11,000 tons over the comparable period of last year, while consumption of crude rubber declined to 294,000 tons, a decrease of 38,000 tons over January-June, 1955.

"Outlook for rubber consumption during the second half of this year indicates a total of 683,000 tons, a decline of about 64,000 tons, with the use of crude rubber declining by 40,000 tons and man-made rubber by about 24,000 tons.

"This forecast is based on an estimated decline of about 12% in new car and truck production, and a lower rate of tire production for automotive manufacturers now holding high tire inventories.

"Shipments of replacement tires during the first half of this year are believed to be higher than normal due to advance buying in anticipation of higher excise taxes effective July 1 as the national highway program gets under way.

"It is now estimated that total rubber consumption in the United States this year will be 1,430,000 tons, down about 100,000 tons from the 1955 record total of 1,530,000 tons," Mr. Richardson said.

Meanwhile, the Secretariat of the International Rubber Study Group estimates world synthetic rubber production (excluding Iron Curtain countries) in May at 105,000 tons, consumption at 95,000 tons and end-of-month stocks at 217,500 tons, an increase of 27,500 tons from the December 31, 1955, position.

World Output Increasing

In May, 1955, synthetic rubber output was 91,333 tons and consumption 87,500 tons. In the first five months of the current year, synthetic rubber production is estimated at 517,000 tons and consumption 477,500 tons, while in the like period of the preceding year production was 418,745 tons and consumption 420,000 tons.

RMA estimates that 549,092 tons of synthetic rubber were produced in the United States in the first six months of this year. Consumption in the same period has been put at 448,627. As of June 30, 1956, there were 166,551 tons of synthetic on hand.

PRICES OF COMMERCIALLY AVAILABLE SYNTHETIC RUBBER POLYMERS

(dry types—per pound carload unless otherwise specified)

Butadiene-Acrylonitrile Types

Butaprene NAA	.5400 [1]
Butaprene NF	.4900 [1]
Butaprene NL	.5000 [1]
Butaprene NXM	.5800 [1]
Chemigum N1	.6400 [2]
Chemigum N3	.5800 [2]
Chemigum N5	.5800 [2]
Chemigum N6	.5000 [2]
Chemigum N7	.5000 [2]
Hycar 1001	.5800 [2]
Hycar 1002	.5000 [2]
Hycar 1014	.6000 [2]
Hycar 1041	.5800 [2]
Hycar 1042	.5000 [2]
Hycar 1043	.5000 [2]
Hycar 1312	.6000 [2]
Hycar 1411	.6200 [2]
Hycar 1432	.5900 [2]
Hycar 1441	.6200 [2]
Paracril AJ	.4850 [2]
Paracril B	.5000 [2]
Paracril BJ	.5000 [2]
Paracril ELT	.5000 [2]
Paracril C	.5800 [2]
Paracril CV	.5900 [2]
Paracril D	.6500 [2]
Paracril 18-80	.6000 [2]
Polysar Krynac 800	.5000 [3]
Polysar Krynac 801	.5800 [3]
Polysar Krynac 802	.5000 [3]
Polysar Krynac 803	.5000 [3]

Butadiene-Styrene Types

Ameripol 1001	.2410 [3]
Ameripol 1002	.2435 [3]
Ameripol 1006	.2410 [3]
Ameripol 1500	.2410 [3]
Ameripol 1501	.2410 [3]
Ameripol 1502	.2410 [3]
Ameripol 1703	.2060 [3]
Ameripol 1705	.2035 [3]
Ameripol 1706	.2035 [3]
Ameripol 1707	.1910 [3]
Ameripol 1709	.1885 [3]
Ameripol 1710	.1885 [3]
Ameripol 1711	.1885 [3]
Ameripol 1712	.1885 [3]
ASRC 1000	.2410 [3]
ASRC 1001	.2410 [3]
ASRC 1004	.2410 [3]
ASRC 1006	.2410 [3]
ASRC 1500	.2410 [3]
ASRC 1502	.2410 [3]
ASRC 1703	.2060 [3]
ASRC 1708	.1910 [3]
Baytown 1600	.1850 [3]
Baytown 1601	.1850 [3]
Baytown 1602	.1850 [3]
Baytown 1801	.1700 [3]
Copo 1500	.2410 [3]
Copo 1502	.2410 [3]
Copo 1712	.1885 [3]
FR-S 1000	.2300 [3]
FR-S 1001	.2300 [3]
FR-S 1004	.2300 [3]
FR-S 1006	.2300 [3]

Butadiene-Styrene (Cont'd)

FR-S 1009	.2600 [3]
FR-S 1010	.2650 [3]
FR-S 1012	.2700 [3]
FR-S 1013	.2600 [3]
FR-S 1015	.2800 [3]
FR-S 1500	.2300 [3]
FR-S 1502	.2300 [3]
FR-S 1703	.1950 [3]
FR-S 1705	.1925 [3]
FR-S 1710	.1775 [3]
Naugapol 1016	.2650 [3]
Naugapol 1018	.2700 [3]
Naugapol 1019	.2650 [3]
Naugapol 1021	.3000 [3]
Naugapol 1022	.2800 [3]
Naugapol 1023	.2850 [3]
Naugapol 1503	.2700 [3]
Naugapol 1504	.2950 [3]
Philprene 1000	.2410 [3]
Philprene 1001	.2410 [3]
Philprene 1006	.2410 [3]
Philprene 1009	.2550 [3]
Philprene 1018	.2700 [3]
Philprene 1019	.2650 [3]
Philprene 1500	.2410 [3]
Philprene 1502	.2410 [3]
Philprene 1503	.2700 [3]
Philprene 1601	.1910 [3]
Philprene 1605	.1870 [3]
Philprene 1703	.2060 [3]
Philprene 1706	.2030 [3]
Philprene 1708	.1910 [3]
Philprene 1712	.1880 [3]
Philprene 1803	.1720 [3]
Pioflex 1006	.2410 [3]
Pioflex 1502	.2410 [3]
Pioflex 1703	.2060 [3]
Pioflex 1710	.1885 [3]
Pioflex 1773	.2060 [3]
Pioflex 1778	.1910 [3]
Polysar Krylene	.2410 [3]
Polysar Krylene NS	.2410 [3]
Polysar Krynol 651	.1885 [3]
Polysar Krynol 652	.1910 [3]
Polysar S	.2410 [3]
Polysar S-50	.2410 [3]
Polysar S-65	.2410 [3]
Polysar S-X 371	.2550 [3]
Polysar SS-250	.3000 [3]
S-1000	.2300 [3]
S-1001	.2300 [3]
S-1002	.2325 [3]
S-1006	.2300 [3]
S-1011	.2325 [3]
S-1013	.2300 [3]
S-1100	.1850 [3]
S-1500	.2300 [3]
S-1501	.2300 [3]
S-1502	.2300 [3]
S-1600	.1850 [3]
S-1601	.1850 [3]
S-1602	.1850 [3]
S-1703	.1950 [3]
S-1705	.1925 [3]
S-1706	.1925 [3]
S-1707	.1800 [3]
S-1709	.1775 [3]
S-1712	.1775 [3]
S-1801	.1700 [3]

Butadiene-Styrene (Cont'd)

S-2000	.2275 [3]
S-2101	.2250 [3]
Synpol 1000	.2410 [3]
Synpol 1001	.2410 [3]
Synpol 1002	.2435 [3]
Synpol 1006	.2410 [3]
Synpol 1007	.2425 [3]
Synpol 1009	.2475 [3]
Synpol 1012	.2425 [3]
Synpol 1013	.2300 [3]
Synpol 1061	.2410 [3]
Synpol 1500	.2410 [3]
Synpol 1502	.2410 [3]
Synpol 1551	.2410 [3]
Synpol 1703	.2060 [3]
Synpol 1707	.1910 [3]
Synpol 1708	.1950 [3]
Synpol 1711	.1900 [3]

Butyl Rubbers

Enjay Butyl 035	.2300 [3]
Enjay Butyl 150	.2300 [3]
Enjay Butyl 165 NS	.2400 [3]
Enjay Butyl 215	.2300 [3]
Enjay Butyl 217	.2300 [3]
Enjay Butyl 218	.2300 [3]
Enjay Butyl 268 NS	.2400 [3]
Enjay Butyl 325	.2300 [3]
Enjay Butyl 365 NS	.2400 [3]
Polysar Butyl 100	.2450 [3]
Polysar Butyl 101	.2275 [3]
Polysar Butyl 200	.2450 [3]
Polysar Butyl 300	.2450 [3]
Polysar Butyl 301	.2550 [3]
Polysar Butyl 400	.2450 [3]

Neoprene

	(prices f.o.b.)
Neoprene Types AC and CG	.5500 [3]
Neoprene Type GN	.4100 [3]
Neoprene Type GN-A	.4100 [3]
Neoprene Type GRT	.4200 [3]
Neoprene Type KNR	.7500 [3]
Neoprene Type S	.4200 [3]
Neoprene Type W	.3900 [3]
Neoprene Type WHV	.3900 [3]
Neoprene Type WRT	.4500 [3]
Neoprene Type WX	.4100 [3]

Silicone Rubbers*

	(prices f.o.b.)
GE (compounded)	2.50 [3]
GE Silicone Gum (not compounded)	4.00 [3]
Silastic (compounded)	1.90 [3]
Union Carbide (gums)	4.00 [3]
Union Carbide (compounds)	2.50 [3]

Polysulfide Rubbers

	(prices f.o.b.)
Thiokol Type A	.4700 [3]
Thiokol Type FA	.6400 [3]
Thiokol PR-1	.9500 [3]
Thiokol Type ST	1.00 [3]

(latices—all prices per pound dry weight)

Butadiene-Acrylonitrile Types

Butaprene N-300	.4600 [1]
Butaprene N-400	.5400 [1]
Butaprene N-401	.5400 [1]
Chemigum 200	.4900 [2]
Chemigum 235	.5400 [2]
Chemigum 236	.5400 [2]
Chemigum 245	.4600 [2]
Chemigum 246	.4600 [2]
Hycar 1512	.4600 [2]
Hycar 1551	.5400 [2]
Hycar 1552	.4600 [2]
Hycar 1561	.5400 [2]
Hycar 1562	.4600 [2]
Hycar 1571	.5900 [2]
Hycar 1572	.5100 [2]
Hycar 1577	.4600 [2]

Butadiene-Styrene Types

Copo 2101	.2800 [3]
Copo 2102	.3100 [3]

Butadiene-Styrene (Cont'd)

Copo 2105	.3100 [3]
Copo X-765	.2900 [3]
FR-S 2000	.2600 [3]
FR-S 2001	.2600 [3]
FR-S 2002	.2850 [3]
FR-S 2003	.2950 [3]
FR-S 2004	.2950 [3]
FR-S 2006	.2600 [3]
FR-S 2105	.3100 [3]
Pliolite 2101	.3000 [3]
Pliolite 2104	.3200 [3]
Pliolite 2105	.3200 [3]
Pliolite X-765	.3000 [3]
Naugatex 2000	.2630 [3]
Naugatex 2001	.2630 [3]
Naugatex 2002	.2880 [3]
Naugatex 2005	.3000 [3]
Naugatex 2006	.2630 [3]
Naugatex 2101	.2850 [3]

Butadiene-Styrene (Cont'd)

Naugatex 2105	.3120 [3]
Naugatex X-767	.3230 [3]
S 2094	.2600 [3]

Neoprene

Neoprene Latex 60	.4000 [3]
Neoprene Latex 571	.3700 [3]
Neoprene Latex 572	.3900 [3]
Neoprene Latex 601-A	.4000 [3]
Neoprene Latex 735	.3800 [3]
Neoprene Latex 736	.3800 [3]
Neoprene Latex 842-A	.3700 [3]
Neoprene Latex 950	.4700 [3]

Polysulfide Rubbers

Thiokol Type MX	.7000 [3]
Thiokol Type WD-2	.9200 [3]
Thiokol Type WD-6	.7000 [3]

Notes: (1) Freight allowed. (2) Freight extra. (3) Freight prepaid. * Covers a wide range of compounds. Readers are urged to check specific prices with producers.

MARKETS

(continued)

Reclaimed Rubber

Industry forecasts at the beginning of 1956 placed reclaimed rubber consumption somewhere between 300,000 and 320,000 long tons this year. Currently available figures indicate that about 102,000 long tons of reclaimed rubber were consumed in the first four months of this year. Were this rate of consumption to continue for the balance of the year, the industry forecasts would be hit squarely.

It should be pointed out, however, that the full impact of slowed automobile production was not felt by reclaimers in the early part of this year. The effect of decreased automobile production will most likely show up in complete first half statistics.

July was relatively a slow month for the reclaim industry in consideration of the fact that most plants were on a vacation schedule. Some heightening of activity is expected in August as plants resume operations.

(Prices for All Areas Except Calif.)

	per lb.
Premium Grade Whole Tire	.11
First Line Whole Tire	.10¼
Second Line Whole Tire	.10
Third Line Whole Tire	.09¼
Fourth Line Whole Tire	.09¼
Black Carcass	.14¼
No. 1 Light Colored Carcass	.20¼
No. 1 Peel	.11
Butyl Tube Reclaim	.15
Natural Rubber Black Tube	.15
Natural Rubber Red Tube	.21
Natural Rubber Gray Tube	.21

Scrap Rubber

Scrap rubber imports during March declined by more than 250,000 pounds from arrivals in the preceding month, according to statistics made available by the U. S. Department of Commerce. Imports of scrap rubber during March came to 2,590,882 pounds valued at $126,287, as against 2,847,574 pounds worth $149,137 in February.

Marketwise, activity continues light in the scrap rubber market, due, in most part, to annual vacation shutdowns by reclaimed rubber producers. What little activity there was centered about peelings, black passenger tubes, mixed auto tires and red passenger tubes.

It may be that the approach of autumn, bringing with it increased industrial activity, may serve to stimulate the scrap market. Meanwhile, prices remain fairly stable. Current quotations as furnished by the trade follow:

(Prices Delivered Akron)

Mixed tires	ton	16.00
Light colored carcass	lb.	.05½
No. 1 peelings	ton	45.00
No. 2 peelings	ton	30.00
No. 3 peelings	ton	21.00
Buffings	ton	16.00
Truck and Bus S.A.G.	ton	20.00
Passenger S.A.G.	ton	17.50
Natural Rubber Red Tubes	lb.	.07½
Natural Rubber Black Tubes	lb.	.06¾
Butyl Rubber Tubes	lb.	.03¾

Tire Fabrics

After many weeks of inactivity, or at least limited, fill-in buying, a revival in the demand for a number of industrial fabrics appears likely in the near future. The relative strength of such a revival in demand could spell the difference between a good year or a comparatively poor year for industrial fabric producers, trade sources point out.

Sales and profits were generally high in the first quarter of 1956. New buying, however, fell off late in the first quarter of this year and has been slow since then. The marked reduction in new orders late in the first quarter and in the second quarter was a result mainly of the cutbacks in automobile production since Detroit is one of the biggest users of industrial textiles. Even a moderately sustained increase in automobile production in the balance of the year is expected to clean up existing cloth inventories quickly and stimulate new purchases.

Revival Signs Evident

Signs of a revival in the demand for industrial fabrics already have become evident although it is still too early to gauge how big a pick-up will develop. Auto producers and plastic coaters, for example, have been ordering out fabrics which were being held on order. Delivery holdups, or deferments, became quite general in the second quarter but in recent weeks a considerable volume of these goods has been released.

A number of coaters are apparently using up stocks rapidly. A market check indicates that some of these firms will be ready to buy more unfinished fabrics within the next month. Many rubber companies have also been getting a considerable number of pilot orders for August delivery. These pilot orders for 1957 models include a wide range of fabrics such as upholstery, high pile auto floor coverings, and hose connections.

Most Producers Optimistic

On the basis of these and other business indicators, most industrial fabric producers are optimistic on the outlook. Both primary weaving mills and rubber and plastic coaters expect that an upswing in demand will develop in the not too distant future and will carry through the year. Any marked pickup in demand could result in a tightening of supplies. Stocks are said to be ample at present on the basis of reduced consumption but would be quickly absorbed in a more active market, many in the trade believe.

(Prices f.o.b. Shipping Point)

Rayon Tire Cord

1100	lb.	.76
1650	lb.	.70
2200	lb.	.70½

Nylon Tire Cord

210	lb.	1.95
840	lb.	1.80

Rayon Graded Fabric

1100	lb.	.72
1650	lb.	.66½
2200	lb.	.66

Cotton Chafers

14.4 oz. (per square yard)	lb.	.70
9.25 oz. (per square yard)	lb.	.65
11.65 oz. (per square yard)	lb.	.61
8.9 oz. (per square yard)	lb.	.67

Liquid Latex

Natural: London observes that July is almost invariably a dead month in latex business and July, 1956, is proving no exception to this rule. Ordinarily, the lack of interest during this month is simply a seasonal holiday phase but on this occasion there has been the added handicap of the recent advances in price. (Current prices for Hevea latex, in bulk, are at the 41c level at East Coast ports).

This barren situation will no doubt resolve itself in the course of the next few weeks granted the normal revival of interest in supplies for post-vacation industrial activity. Meanwhile, it will be a waiting game for producers who are not too badly off by reason of earlier forward sales and recent curtailment of production to relieve pressure of supplies on the market.

Synthetic: The Commerce Department states that the usage of rubber latices in the past few months shows some newsworthy developments, despite a 4.5% decline in total volume. In non-transportation products, the use of S-type latex has gained at the expense of natural latex, and N-type latex has increased in demand somewhat more than has neoprene.

In transportation products, a reduced consumption is reported for both S-type and natural latices. Natural latex declined from 54% of the latices total in early 1955 to 47% in the first quarter of 1956, while S-type latex has risen from 36.5% to 42.3% of the total.

Through improved production techniques in S-type latex, a uniformity of larger particle size has been attained that permits replacement of natural to a much greater extent in latex foam.

Cotton

The price of middling uplands on the New York Cotton Exchange has moved in a range of 350 points since our last report (June 29), high for the period being 36.85c reached on July 25, and low being 33.35c reached on July 30. The average price of middling uplands for the month of July was 35.43c based on 21 trading days. This compares with an average of 36.37c in June.

The Department of Agriculture has announced that the average loan rate for 1956 crop upland cotton, basis middling ⅞-inch, will be 29.34c per pound gross weight. This final rate reflects 82½% of the parity price of 35.56c per pound for upland cotton. The average rate for middling 1-inch cotton will be 340 points (3.40c per lb.) above the average rate for middling ⅞-inch cotton, or 32.74c per pound gross weight.

Loan rates for the various other grade and staple length combinations of upland cotton under the 1956 program will be calculated in relation to the price support rate for middling inch cotton.

France is scheduled to import about 285,000 tons of raw cotton in the 1956-57 season under a newly drafted program. These imports will be handled in two parts. The first portion of 47,000 tons will be imported freely—in the main against payment in hard currencies for which the French Finance Ministry has given the necessary authorization. The remainder of the imports will be bought in countries with which France has trade agreements or earlier commitments.

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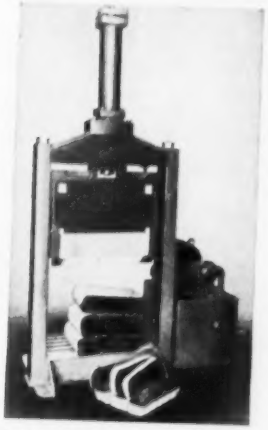

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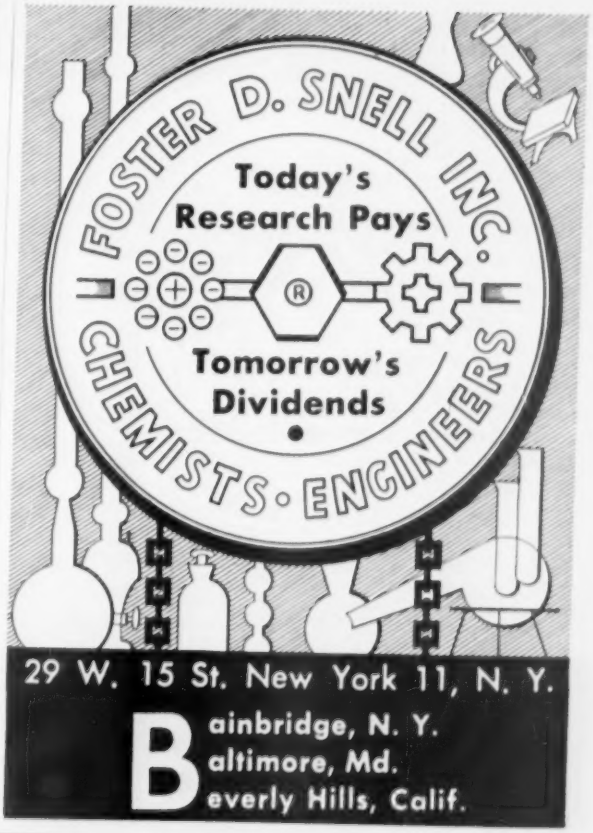

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MARKET PRICES

CHEMICALS & COMPOUNDING INGREDIENTS

AUGUST 1, 1956

Prices are, in general, f.o.b. works and cover the domestic markets only. Export prices, as a rule, are usually slightly higher, due to packing regulations, special handling, etc.

Abbreviations: bbls., barrels; c.l., carload; cyl., cylinder; dlvd., delivered; dms., drums; eqld., equalized; l.c.l., less than carload; M.B. masterbatch; min., minimum; ref., refined; sap., saponified; sp., special; syn., synthetic; t.c., tank cars.

*Trademark. †For Export Only.

The arrangement of this section closely follows the Chemical Section of the 1955-56 RUBBER RED BOOK. Readers are referred to that edition for the correct classification of any material or brand name. Suppliers of every material are contacted for price information. However, only those materials are listed for which quotations have been furnished within the past six months. The quotations are not guaranteed and prospective purchasers should contact suppliers for information. Suppliers are requested to send current price information to the Market Editor, RUBBER AGE.

ACCELERATORS

A-1 (Thiocarbanilide)*	lb.	.72	.79
A-32*	lb.	.66	.80
A-100*	lb.	.52	.66
Accelerator No. 8*	lb.	—	1.10
Accelerator—49*	lb.	.55	.56
Accelerator 89*	lb.	—	1.20
Accelerator 108*	lb.	—	.90
Accelerator—552*	lb.	—	2.25
Accelerator—808*	lb.	.66	.68
Accelerator—833*	lb.	1.17	1.19
Accelerator B*	lb.	—	.89
Altax*	lb.	.50	.52
Ancap*(†)	lb.	.38	.40
Ancatax*(†)	lb.	.48	.50
Ancazate BU (ET & ME)*(†)	lb.	—	1.07
Ancazide ET*(†)	lb.	—	1.07
ME*(†)	lb.	—	1.14
Arazate*	lb.	—	2.25
Beutene*	lb.	.66	.68
Bismate, Rodform*	lb.	—	3.00
Butazate*	lb.	—	1.04
Butyl Eight*	lb.	1.10	1.35
Captax*	lb.	.40	.42
C-P-B*	lb.	—	1.95
Cumate, Rodform*	lb.	—	1.45
Diorthotolylguanidine	lb.	.60	.61
Diphenylguanidine	lb.	.56	.57
El-Sixty*	lb.	.58	.65
Ethazate*	lb.	—	1.04
50D*	lb.	—	.85
Ethyl Thiurad*	lb.	—	1.04
Ethyl Tuex*	lb.	—	1.04
Ethylac*	lb.	.93	.95
Guantal*	lb.	.58	.65
Harvex*	lb.	.70	.76
Hepteen Base*	lb.	—	1.85
Kure-Blend MT*	lb.	—	.70
Ledate, Rodform*	lb.	—	1.04
MBT-XXX*	lb.	.51	.53
Merac*	lb.	.75	1.05
Mercaptobenzothiazole	lb.	.40	.42
Mercaptobenzothiazyl Disulfide	lb.	.50	.52
Mertax*	lb.	.51	.58
Methazate*	lb.	—	1.04
Monex*	lb.	—	1.14
Mono Thiurad*	lb.	—	1.14
Morfex*	lb.	.65	.67
2-MT	lb.	—	1.00
NA-22* (for neoprene)	lb.	—	1.00
NOBS No. 1*	lb.	.72	.74
Special*	lb.	.77	.79
O-X-A-F	lb.	.51	.53
Pentex*	lb.	—	1.04
Flour*	lb.	—	.21
Permalux (Neoprene)*	lb.	—	2.17
Phenex*	lb.	.52	.57
Polyac*	lb.	—	1.80
R-2 Crystals*	lb.	—	4.35
Rotax*	lb.	.51	.53
RZ-50-A*	lb.	—	1.00
B*	lb.	—	1.00
SA 52*	lb.	—	1.14
SA 57*	lb.	—	1.04
SA 62*	lb.	—	1.04
SA 66*	lb.	—	4.25
SA 67*	lb.	—	1.04
SA 77*	lb.	—	1.04
Santocure*	lb.	.72	.79
NS*	lb.	.78	.85
Selenac* (Ethyl, Methyl)	lb.	—	4.23
Setsit-5*	lb.	.75	1.05
9*	lb.	.85	1.15
SPDX-GH*	lb.	.69	.71
GL*	lb.	1.20	1.30
Tellurac*	lb.	—	1.45
Tepidone*	lb.	.45	.48
Tetrone A*	lb.	—	7.91
Thiofide*	lb.	.50	.57
S*	lb.	.52	.59
Thionex*	lb.	—	1.14
Thiotax*	lb.	.40	.47
Thiurad*	lb.	—	1.14
Thiuram E*	lb.	—	1.04
M*	lb.	—	1.14
Trimene*	lb.	.56	.58
Base*	lb.	1.03	1.06
Triphenyl Guanidine	lb.	—	.90
Tuads* (Ethyl)	lb.	—	1.04
Tuads* (Methyl)	lb.	—	1.14
Tuex*	lb.	—	1.14
Ultex*	lb.	1.00	1.10
Unads*	lb.	—	1.14
Vulcacure NB*	lb.	—	.45
ZB*	lb.	—	.85
ZE*	lb.	—	.85
ZM*	lb.	—	.85
Z-B-X*	lb.	—	2.45
Zenite*	lb.	.50	.52
A*	lb.	.59	.61
Zenite Special*	lb.	.51	.53
Zetax* (uncoated)	lb.	.51	.53
Zimate* (Butyl)	lb.	—	1.04
Zimate* (Ethyl)	lb.	—	1.04
Zimate* (Methyl)	lb.	—	1.04

ACTIVATORS

Blue Lead Sublimed (dlvd.)	lb.	.17¼	.18¼
Cottonseed Fatty Acids			
Wochem 210*	lb.	—	.15¼
211*	lb.	—	.15¼
Fish Oil, Hydrogenated, Fatty Acid			
DAR-S* (dlvd.)	lb.	.12½	.14½
DAR-HY* (dlvd.)	lb.	.14¼	.16¼
Hydrofol Acids* (dlvd.)	lb.	.15¼	.17¼
Hyfac 430* (dlvd.)	lb.	.16¼	.18¼
Neo-Fat H.F.O.* (dlvd.)	lb.	.14½	.15¼
Neutrex* (dlvd.)	lb.	.15	.17
Stearex Beads* (dlvd.)	lb.	.09¼	.10¼
Stearite*	lb.	.12	.14
Talene* (dlvd.)	lb.	.15¼	.17¼
Lime, Hydrated			
Arrowhead*	ton	—	21.00
Marblehead*	ton	—	17.00
Sierra*	ton	—	22.50
Litharge			
Eagle-Picher* (l.c.l.)	lb.	.19	—
SB* (dlvd.)	lb.	—	.18½
Magnesium Oxide, Heavy			
General Magnesite 500*	lb.	.05	.05½
600*	lb.	.05½	.06
Kaiser 325*	lb.	.057	.073
Michigan No. 15*	lb.	.06	.06½
Magnesium Oxide, Light			
Baker's* (neoprene grade)	lb.	.25½	.26
Carey Mag*	lb.	.25¼	.26
General Magnesite* (neoprene grade)	lb.	.30	.32
General Magnesite No. 101*	lb.	.25¼	.28
Genmag ML*	lb.	.25¼	.28
K & M* (neoprene grade)	lb.	.29¼	.30
Light Calcined Magnesia No. X-01*	lb.	.25¼	.26

ACTIVATORS (Cont'd)

Magnesium Oxide, Light (cont'd)			
Light Carbonate of Magnesia, Technical	lb.	.10½	.12
Maglite D*	lb.	.25¼	.26
I. and M*	lb.	.29¼	.30
Marine's* (neoprene grade) (l.c.l.)	lb.	.29¼	.30
Michigan No. 30*	lb.	.25¼	.26
Neomag Powder*	lb.	.29¼	.30
Pellets*	lb.	.31¼	.32
Michigan No. 40*	lb.	.29¼	.30
Oleic Acid			
Emersol 210* (dlvd.)	lb.	.18½	.20½
Groco Red Oil*	lb.	.18½	.20½
Neo-Fat 92-04*	lb.	.20½	.22½
94-04*	lb.	.18½	.20½
Wochem 310, 311	lb.	—	.18½
Palm Fatty Acids			
Groco 45*	lb.	.14¼	.16¼
Wochem 280*	lb.	—	.14¼
281*	lb.	—	.15¼
Potassium Oleate (dms.)	lb.	.30	.73
Red Lead			
Eagle-Picher* (l.c.l.)	lb.	.20	—
No. 2 RM* (dlvd.)	lb.	—	.18½
Sodium Laurate, 75%	lb.	.64	.89
Sodium Oleate, 75%	lb.	.54	.79
Paste (dms.)	lb.	.39	.64
Sodium Stearate, 75%	lb.	.54	.89
Stearic Acid, Single Pressed			
Emersol 110* (dlvd.)	lb.	.14¼	.16¼
Groco 53*	lb.	.14¼	.16¼
Neo-Fat 18-53*	lb.	.14¼	.16¼
Standard Pearlstearic* (dlvd.)	lb.	.14¼	.16¼
Wochem 730*	lb.	—	.11½
Stearex B* (dlvd.)	lb.	.15½	.16¼
Stearic Acid, Double Pressed			
Choice Pearlstearic* (dlvd.)	lb.	.15¼	.17¼
Emersol 120* (dlvd.)	lb.	.15¼	.17¼
Groco 54*	lb.	.15¼	.17¼
Hydrofol Acid 51RG	lb.	.11¼	.13¼
Neo-Fat 18-54*	lb.	.15¼	.17¼
Wochem 731*	lb.	—	.14¼
Stearic Acid, Other			
Extra Pearlstearic* (dlvd.)	lb.	.17½	.19½
Groco*	lb.	.12	.14
Neo-Fat 18*	lb.	.17½	.18½
18-58*	lb.	.12	.13
18-61*	lb.	.15¼	.16¼
Stearite*	lb.	.12½	.14½
Wochem 720*	lb.	—	.11½
721*	lb.	—	.11½
732*	lb.	—	.15¼
White Lead Basic Carbonate	lb.	.19	.20
White Lead Basic Sulfate	lb.	.17¼	.18¼
Zinc Laurate			
Laurex*	lb.	.33	.34
Zinc Stearate	lb.	.39	.44
Aquazinc K.C.*	lb.	.30	.55
Crown Brand*	lb.	.39	.44

Unclassified Activators

Actifat* (dms.)	lb.	—	.18
Aktone*	lb.	.21¼	.23¼
Barak*	lb.	—	.62
Curade*	lb.	.57	.59
Dibenzo G-M-F	lb.	—	2.60
D-B-A*	lb.	—	1.95
G-M-F*	lb.	—	2.60
Dibutylamine (dlvd.)	lb.	.55	.56
MODX*	lb.	.32½	.34½
Neo-Fat 42-07*	lb.	.10¼	.12¼
Ridacto* (dms.)	lb.	.25	.26
Snodotte* (dlvd.)	lb.	.19	.21
Vulklor*	lb.	.88	.98

ANTI-COAGULANTS

Aqua Ammonia* (dms.)	lb.	.031	.035
M.B.M.C.* (l.c.l.)	lb.	.54	.76

ANTI-FOAMING AGENTS

Aero Anti Foam H*	lb.	—	.20
Regular*	lb.	—	.12
Anhydrol 6991*	lb.	.51	.56
D.C. Antifoam A*	lb.	5.45	6.65
Antifoam A Emulsion*	lb.	2.05	4.00
Antifoam AF Emulsion*	lb.	2.05	2.85
Defoama W-1701*	lb.	—	.12½
Defoamer A-25*	lb.	—	3.00
Defoamer 630*	lb.	—	.14
Deltyl Prime	lb.	.70	.80

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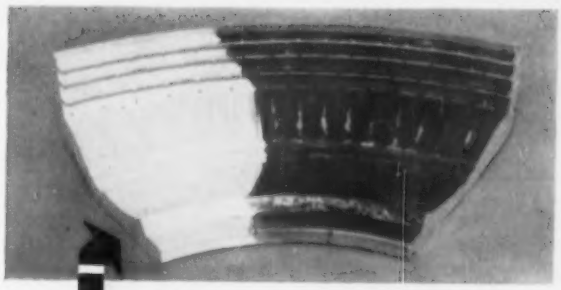

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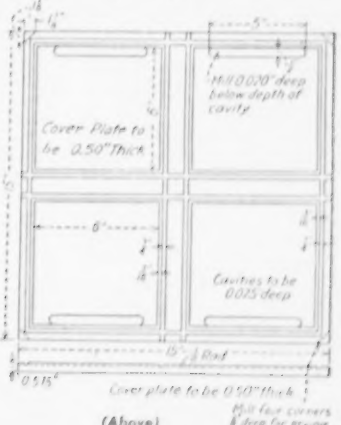
For Rubber Testing & Production

Shown here are but a few of the many types of rubber working equipment available. Please submit your problem.



(Above)

Standard ASTM and Federal dies for cutting test tensile and tear strength samples, and dies for slab curing carried in stock. Write for catalog.

Pacific Coast: H. M. Royal, Inc., Los Angeles

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ANTI-FOAMING AGENTS (Cont'd)

G-E Antifoam SS-24*	lb.	5.30	6.65
SS-60*	lb.	2.05	3.75
SS-66*	lb.	5.30	6.65
Kessco X-3* (dms.)	lb.	—	.35
X-180*	lb.	—	.29½
X-181*	lb.	—	.38½
Nopco 1407*	lb.	.19½	.20½
1497-V*	lb.	.13¼	.14¼
1907-B*	lb.	.18¼	.19¼
JMK*	lb.	.48	.49
JMU*	lb.	.22½	.23½
JMY*	lb.	.19¼	.20¼
Pluronic L61*	lb.	.33½	.39
RS-968*	lb.	.38	.38½
Terpinol Prime No. 1	lb.	.35	.50
Tributyl Phosphate (dms.)	lb.	.52	.53

ANTIOXIDANTS

Agebest 1293-22A*	lb.	1.90	2.00
AgeRite Alba*	lb.	2.35	2.45
Gel*	lb.	.64	.66
Hipar*	lb.	.98	1.00
H.P.*	lb.	.72	.74
Powder*	lb.	.52	.54
Resin*	lb.	.75	.77
Resin D*	lb.	.52	.54
Spar*	lb.	.52	.54
Stalite*	lb.	.52	.54
Stalite S*	lb.	.52	.54
Superlite*	lb.	.52	.54
White*	lb.	1.45	1.55
Akroflex C*	lb.	.77	.79
CD*	lb.	.72	.74
Aminox*	lb.	.52	.54
Antioxidant 425*	lb.	2.47	2.50
Antioxidant 2246*	lb.	1.50	1.53
Antox*	lb.	.52	.54
Aranox*	lb.	—	3.25
Benzoquinone	lb.	1.50	1.75
Betanox Special*	lb.	.80	.82
B-L-E*	lb.	.52	.54
B-X-A*	lb.	.52	.54
Deenax*	lb.	.95	1.05
Ditert-Butyl-para-Cresol	lb.	.86	1.16
Eugenol C-95%*	lb.	2.30	2.50
Flectol H*	lb.	.52	.59
Flexamine*	lb.	.72	.74
Ionol* (dms.)	lb.	.91	.93
Neozone A*	lb.	.56	.58
C*	lb.	—	.80
D*	lb.	.52	.54
Nullapon BF-12*	lb.	—	.21½
BF-13*	lb.	—	.29
BF-78*	lb.	—	.62
BF-Acid*	lb.	—	.97½
Octamine*	lb.	.52	.54
Oxidex*	lb.	—	3.60
PDA-10*	lb.	.46	.48
Permalux*	lb.	—	2.17
Polygard*	lb.	.52	.54
Santoflex AW*	lb.	.78	.85
DD*	lb.	.52	.59
75*	lb.	.92	.99
Santovar-A*	lb.	1.50	1.57
Santowhite Crystals*	lb.	1.60	1.67
Santowhite L*	lb.	.52	.59
MK*	lb.	1.29	1.36
Powder*	lb.	1.60	1.67
Sequestrene AA*	lb.	—	.97½
NA2*	lb.	—	.79½
NA3*	lb.	—	.77½
Stabilite*	lb.	.55	.57
Alba*	lb.	.72	.77
FLX*	lb.	—	.65
L*	lb.	.60	.62
White*	lb.	.52	.54
White Powder*	lb.	.41	.43
Stabilizer No. 1*	lb.	1.55	1.80
Stabilizer No. 9-A*	lb.	.80	1.05
Styphen I*	lb.	.51	.55
Sunolite*	lb.	.16	.22
Tannic Acid, Tech.	lb.	.46	.48
Thermoflex A*	lb.	.98	1.00
V-G-B*	lb.	.70	.72
Wing-Stay S*	lb.	.51	.53

ANTI-SCORCHING AGENTS

Armeen HT*	lb.	.36	.40
Good-rite Vultrol*	lb.	.62	.64
Harcopol 1183*	lb.	.70	.74
Retarder W*	lb.	—	.45
Sodium Acetate 60-62% Crystals	lb.	.08	.08½

ANTISEPTICS AND GERMICIDES

A.P.C. 6901*	lb.	.32	.38
Arquad S*	lb.	.24	.26
Formaldehyde (dms.)	lb.	.06	.076
G-4* (bbls.)	lb.	1.09	1.29
G-11*	lb.	1.98	2.08
Halane*	lb.	.50	.60
Ortho Cresol (26°—27°)	lb.	.14	.16¼
Retarder D*	lb.	.42	.50
Soligen Drier—Copper 8%* (dms.)	lb.	.20¼	.21½
Zinc 8%* (dms.)	lb.	.22¼	.23½
Vancide*	lb.	—	.80

ANTI-WEBBING AGENTS (for Latex)

DC 7 Compound*	lb.	5.13	6.50
Webnix 34*	lb.	1.25	2.25

AROMATICS (DEODORANTS)

Airkem 115*	gal.	—	6.50
122*	gal.	—	6.50
186*	gal.	—	6.50
Alamask AA*	lb.	—	3.00
AF*	lb.	—	2.50
AO*	lb.	—	1.50
AR*	lb.	—	.50
BG*	lb.	—	1.15
BGM*	lb.	—	.60
CV*	lb.	—	2.40
DI*	lb.	—	3.35
DL*	lb.	—	1.95
H*	lb.	—	5.50
LD*	lb.	—	.75
ND*	lb.	—	2.75
O*	lb.	—	6.50
OS*	lb.	—	5.25
Bouquet 149*	lb.	—	3.00
Coumarin*	lb.	2.95	3.00
Cyrodex 19*	lb.	4.75	4.90
188*	lb.	5.75	5.90
198*	lb.	6.75	6.90
Deodorant 65*	lb.	—	1.85
Deodorant L-37*	lb.	2.15	2.25
L-44*	lb.	2.65	2.75
N.L.T.X.*	lb.	1.90	2.00
Deodorant Oil GD 6422*	lb.	1.90	2.20
GD 6423*	lb.	1.60	1.90
GD 6575*	lb.	2.40	2.90
GD 31063*	lb.	2.25	2.75
Ethavan*	lb.	6.75	6.80
Latex Perfume 5*	lb.	—	3.25
6*	lb.	—	7.50
9*	lb.	—	1.25
Naugaromes* (dms.)	lb.	.60	3.00
Neutroleum Delta*	lb.	—	2.60
Gamma*	lb.	—	3.60
Parador A*	lb.	1.80	2.10
C*	lb.	2.00	2.50
E*	lb.	.25	.40
GD 5280*	lb.	2.00	2.50
GD 53481*	lb.	1.70	2.00
Perfume Oil Bouquet Vanilla M*	lb.	1.60	1.70
Rodo No. 0*	lb.	4.00	4.50
No. 10*	lb.	5.00	5.50
Rubbaromes* (dms.)	lb.	.60	3.80
Rubber Perfume 12*	lb.	—	4.35
Russian Leather 7*	lb.	—	4.35
Vanillin	lb.	3.00	3.25

BLOWING AGENTS

Ammonium Bicarbonate	cwt.	—	8.00
Better Blend Soda* (c.l., bags)	cwt.	—	2.40
Blowing Agent CP-975*	lb.	.32	.35
Celogen*	lb.	—	1.95
AZ*	lb.	—	1.95
Diazo Amino Benzine	lb.	—	.73
Neo Fat 42-12*	lb.	.10¼	.12¼
Sodium Bicarbonate, U.S.P. (c.l., bags)	cwt.	—	2.30
Sponge Paste*	lb.	—	.20
Unicel ND*	lb.	—	.76
S*	lb.	—	.20
Urea	lb.	.06	.07

BONDING AGENTS

Base 6986*	lb.	.27	.32
Braze*	gal.	6.00	9.00
Cover Cement*	gal.	2.50	4.00
Durez 12987*	lb.	—	.54
Gen-Tac Latex*	lb.	.75	.85½
Hylene M*	lb.	3.50	3.75
M-50*	lb.	1.90	2.15
Penacolite B1A*	lb.	—	.95
R-2710*	lb.	—	.95
Pliobond 20*	gal.	2.91	4.23
30*	gal.	3.65	4.97
Rex Compounds*	gal.	1.30	1.90
Thixons*	gal.	3.30	9.00
Ty-Ply Q (BN & S)*	gal.	6.75	8.00
Tygobond 30*	gal.	5.50	7.45

COAGULANTS

Acetic Acid—56% (bbls.)	cwt.	9.00	11.00
Glacial 99½% (dms.)	lb.	.12	.13
Calcium Nitrate, Tech. Flake	lb.	.12½	.15
Hydroxyacetic Acid—70% (dms.)	lb.	—	.084
Zinc Nitrate, Tech. Flake	lb.	—	.22½

COLORING AGENTS

Black

Aquablak B*	lb.	.09¼	.10¼
M*	lb.	.10½	.11
R*	lb.	.10¾	.11¼
S*	lb.	.11¾	.12¼
Black Shield 4-35* (dms.)	lb.	—	.09
No. 5	lb.	—	.093
No. 6	lb.	—	.08
No. 14	lb.	—	.11
Carbon Black See *Reinforcing Agents*			
Lamplack No. 10*	lb.	.06	.09
Mapico Black Iron Oxide* (50 lb. bags)	lb.	.14¼	.14½
Pure Black Iron Oxide	lb.	.14¾	.14½

COLORING AGENTS (Cont'd)

Blue

Blue Powders	lb.	2.20	3.75
Cooke M.B. Blue*	lb.	2.45	2.85
Monastral Rubber Blue CPL*	lb.	—	1.95
PCD, Dispersed*	lb.	—	2.20
Peacoline Blue*	lb.	—	3.85
Ramapo Blue*	lb.	2.75	3.00
Rubber Blue GD* (Disp.)	lb.	—	4.55
Rubber Blue X-1999*	lb.	—	1.80
Rubber Dispersed Blues	lb.	2.52	2.78
Solfast Sky Blue*	lb.	3.00	3.60
Syntheline Blue*	lb.	—	3.85
Stan-Tone MBS*	lb.	1.55	4.55
GPE*	lb.	—	2.50
PC*	lb.	1.40	1.80
Ultramarine	lb.	.14	.30
Vansul Blue M.B.*	lb.	.95	2.60

Brown

Brown Iron Oxide	lb.	.15¼	.15½
Mapico Brown* (50 lb. bags)	lb.	.15¼	.15½
Stan-Tone GPE*	lb.	—	3.00
Vansul Brown M.B.* (Organic)	lb.	—	2.15

Green

Cooke M.B. Green*	lb.	1.60	2.80
Filo Green*	lb.	—	.34
Green Chromium Oxide, Pure	lb.	—	.42½
Green Chromium Oxide, Pure Hydrated	lb.	—	1.15
Green Powders	lb.	1.35	3.95
Monastral Rubber Green GSD* (Dispersed)	lb.	—	2.66
GSL*	lb.	—	2.20
Permansa Green CP-594*	lb.	—	1.35
Pigment Green B*	lb.	—	1.35
GL-652D*	lb.	.90	1.00
Ramapo Green*	lb.	—	3.50
Rubber Dispersed Greens	lb.	1.23	3.08
Rubber Green FD* (Disp.)	lb.	—	2.05
Rubber Green X-1292*	lb.	—	1.55
Solfast Green*	lb.	—	3.95
Stan-Tone MBS*	lb.	1.55	3.35
GPE*	lb.	3.00	4.50
PC*	lb.	1.70	3.80
Vansul Green M.B.*	lb.	1.05	2.90

Maroon

Maroon Powders	lb.	.79	3.60
Pyrolux Maroon*	lb.	—	3.65
Vansul Maroon M.B.*	lb.	—	3.35

Orange

Benzidene Orange	lb.	—	3.00
Mercadium X-2667*	lb.	—	1.78
Molybdate Orange*	lb.	—	.46½
Oswego Orange X2065*	lb.	—	3.00
Rubber Orange OD* (Disp.)	lb.	—	2.25
Solfast Orange*	lb.	—	2.35
Stan-Tone Cadmium Dry*	lb.	2.02	4.45
Cadmium Paste*	lb.	2.47	3.20
GPE*	lb.	1.20	4.35
PC*	lb.	.75	2.75
Vansul Orange M.B.*	lb.	2.40	2.45

Red

Arcturus Reds*	lb.	—	1.13
Antimony Trisulfide	lb.	.72	.78
R.M.P. Sulfur Free*	lb.	—	.78
R.M.P. No. 3*	lb.	—	.72
Brilliant Toning Reds*	lb.	1.65	1.95
Cadmolith Red* (dms.)	lb.	2.37	3.82
Cooke M.B. Red*	lb.	1.05	3.25
Graphic Red (dlvd.)	lb.	.88	.93
Indian Red, American, Pure*	lb.	.13¼	.14
Doxco (English)*	lb.	.11½	.11¾
Kroma Reds*	lb.	.14	.15
Lake Red C*	lb.	—	1.13
Mapico Reds* (50 lb. bags)	lb.	.13¼	.14
Mercadium X-2668 Light*	lb.	—	1.95
X-2669 Medium Light*	lb.	—	2.10
X-2670 Medium*	lb.	—	2.25
X-2671 Dark*	lb.	—	2.40
Oximony Red Iron Oxide	lb.	.12¾	.13
Plasticone Reds*	lb.	—	4.60
Polaris Red*	lb.	—	1.65
Recco Red Oxide*	lb.	.12	.13
Red Iron Oxide, Light	lb.	.13¼	.14
Red Powders	lb.	—	4.40
Rubber Dispersed Reds	lb.	1.47	3.58
Rubber Red PBD* (Disp.)	lb.	—	1.75
2BD, Dispersed*	lb.	—	1.80
2BL*	lb.	—	1.24
PBL*	lb.	—	1.65
Rubanox Reds*	lb.	1.40	1.50
Rubber Red CP-339* (dlvd.)	lb.	—	1.10
Rubber Red X-1148*	lb.	—	.88
Solfast Red*	lb.	1.40	1.50
Stan-Tone MBS*	lb.	1.20	3.53
GPE*	lb.	1.65	2.00
PC*	lb.	1.30	2.50
PDS*	lb.	1.40	1.55
PVC*	lb.	1.65	1.90
Sun Burnt Red*	lb.	.11½	.11¾
Vansul Red M.B.*	lb.	1.00	3.35
Watchung Red*	lb.	1.65	1.95

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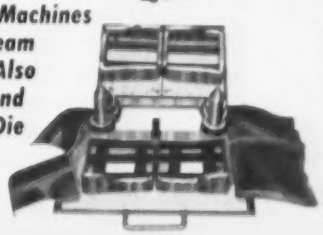

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COLORING AGENTS (Cont'd)

Tan

Mapico Tan 15* (50 lb. bags)	lb.	.20¼	.21
29* (50 lb. bags)	lb.	.20¼	.20½

White—Lithopone

Albalith*	lb.	.0800	.0975
Eagle-Picher*	lb.	.0800	.0975
Permolith*	lb.	.0800	.0875
Sunolith*	lb.	.0800	.0875

White—Titanium Pigments

Stan-Tone PC*	lb.	——	.55
Ti-Cal*	lb.	.09	.09¼
R-25*, R-22*, R-27*, R-30*	lb.	.09	.09½
R-60*	lb.	.09¼	.09¼
Ti-Pure*	lb.	.24½	.27½
Anatase Grades*	lb.	.24½	.25½
Rutile Grades*	lb.	.26½	.27½
Titanox A*—all grades (dlvd.)	lb.	.24½	.25½
C-50* (dlvd.)	lb.	.13½	.14½
RA* (dlvd.)	lb.	.26½	.27½
RA-10* (dlvd.)	lb.	.26½	.27½
RA-NC* (dlvd.)	lb.	.26½	.27½
RC* (dlvd.)	lb.	.09¼	.09½
RC-HT* (dlvd.)	lb.	.09	.09½
Unitane O-110*	lb.	——	.245
O-220*	lb.	——	.245
O-310*	lb.	——	.245
O-410*	lb.	——	.265
OR-150*	lb.	——	.265
OR-250*	lb.	——	.265
OR-340*	lb.	——	.265
OR-342*	lb.	——	.265
OR-350*	lb.	——	.265
OR-540*	lb.	——	.265
OR-640*	lb.	——	.265
Zopaque*	lb.	.24½	.25½
R*	lb.	.26½	.27½

White—Zinc Oxide (American Process)

AZO-ZZZ 11* (22*, 33*, 44*, 55*)	lb.	.1450	.1550
Eagle-Picher AAA*	lb.	.1450	.1550
Horse Head Special*	lb.	.1450	.1550
XX*	lb.	.1450	.1550
Protox 166*	lb.	.1450	.1550
167*	lb.	.1450	.1550
267* (pelleted)	lb.	.1450	.1550
St. Joes Black Label*	lb.	.1450	.1550
Green Label*	lb.	.1450	.1550
Red Label*	lb.	.1450	.1550

White—Zinc Oxide (Dispersed)

Dispersed Zinc Oxide	lb.	——	.13

White—Zinc Oxide (French Process)

AZO-ZZZ 66	lb.	.1450	.1550
Florence Green Seal*	lb.	.1625	.1725
Red Seal*	lb.	.1575	.1675
White Seal*	lb.	.1675	.1775
Kadox 25*	lb.	.1675	.1775
15*, 17*, 72* & 515*	lb.	.1450	.1550
Protox 168*	lb.	.1450	.1550
169*	lb.	.1450	.1550
268* (pelleted)	lb.	.1450	.1550
U.S.P. (cartons)	lb.	.1775	.1875
XX-78* (l.c.l.)	lb.	——	.15½

White—Zinc Sulfide

Cryptone ZS*	lb.	.2530	.2630

Yellow

Benzidene Lightfast	lb.	2.75	3.50
Benzidine Yellow	lb.	2.10	2.35
Cadmolith Yellow* (dms.)	lb.	1.20	——
Chrome Yellow	lb.	——	.33½
Cooke M.B. Yellow 405*	lb.	2.15	2.75
Iron Oxide, Pure			
Light Shades	lb.	.12	.12¼
Dark Shades	lb.	.11½	.11¾
Mapico Yellow* (50 lb. bags)	lb.	.12	.12¼
Rubber Dispersed Yellows	lb.	1.27	2.13
Rubber Yellow GD* (disp.)	lb.	——	2.15
GL*	lb.	——	2.05
Rubber Yellow X-1940*	lb.	——	2.35
Stan-Tone Cadmium Dry*	lb.	2.80	3.03
Cadmium Paste*	lb.	1.63	1.99
MBS*	lb.	1.30	2.20
GPF*	lb.	4.25	4.50
PC*	lb.	.55	3.40
Sumatra Yellow X-1940*	lb.	——	2.35
Toluidine Yellow	lb.	2.00	2.10
YL-660 D*	lb.	1.20	1.25
Oximony Iron Oxide	lb.	.12¼	.13
Vansul Yellow M.B.*	lb.	1.00	2.00
Yellow Powders	lb.	2.00	5.00
Zinc Yellow	lb.	——	.27½

DISPERSING AGENTS

Anchoid*(†)	lb.	.24	.25
Anhydrapent*	lb.	.56	.59
Armeen 18*	lb.	.38	.40

DISPERSING AGENTS (Cont'd)

Blancol*	lb.	——	.15¾
Darvan No. 1* (and No. 2*)	lb.	.22	.30
Daxad 11* (21*, 23*)	lb.	.08	.30
Diethanolamine (dms., dlvd.)	lb.	.24½	.27½
Dispersaid*	lb.	1.25	1.35
Emcol K-8300* (dms.)	lb.	.14	.18
P10-59	lb.	.32	——
5120	lb.	.31	——
5138	lb.	.31	——
Emulphor ON-870*	lb.	——	.55
Furala*	lb.	.06½	.07½
Halloid*	lb.	.04½	.05½
Hyeryl A-1000*	lb.	——	.148
Igepal CO-630*	lb.	——	.29
Igepon T-73*	lb.	——	.29½
Kyro EO* (dms.)	lb.	——	.29¾
Leonil SA*	lb.	——	.55
Lomar PW*	lb.	——	.18
Marasperse C*	lb.	.06¼	.06¼
CB*	lb.	.12¼	.13¼
N*	lb.	.09½	.10½
Monoethanolamine (dms., dlvd.)	lb.	.25	.28
Naccotan A*	lb.	.16½	.21
Nekal BA-75*	lb.	——	.40
BX-78*	lb.	——	.64
Nopco 1187-X*	lb.	.15	.16
Pluronic F68*	lb.	.38½	.44
Polyfon*	lb.	.08	.09
R & R 551*	lb.	——	.28
Rubbex*	lb.	.267	.285
Stablex B*	lb.	.50	.95
Stan-Chem BQC*	lb.	.12¼	.17¼
1067*	lb.	——	.13½
1471*	lb.	.1687	.2187
2251*	lb.	.12¼	.17¼
Trenamine D-25*	lb.	.32½	.36
Triethanolamine (dms., dlvd.)	lb.	.22	.25
U-3051*	lb.	——	.148
Yelkin TT*	lb.	.13	.16
TTS*	lb.	.13	.16

EXTENDERS

Advagum 1098*	lb.	——	.64
Arcco 1071-13B*	lb.	.14½	.15½
1073-18B*	lb.	.13½	.14½
1294-36B*	lb.	.11½	.12½
Car-Bel-Ex-A* (and B*)	lb.	——	.14
Extender 600*	lb.	——	.1765
Facile Gum 4A*	lb.	.48	.50
Millex*	lb.	——	.07
W*	lb.	——	.07
Nopco 2271*	lb.	.15½	.16½
Polyco 418*	lb.	.17	.18
PR-162 Latex Extender*	lb.	——	.182
Solvitose HDF*	lb.	.22	.25
Synprolac*	lb.	.16	.23
Synprowax*	lb.	——	.23
Vistanex*	lb.	——	.35

FILLERS (Inert and Reinforcing)

Abrasives			
Carbonite*	lb.	.21½	1.35
Lionite*	lb.	.16	1.27
Pumice	lb.	.03	.05
Walnut Shell Grits	lb.	.05	.08
Aluminum Hydrate	lb.	.0850	.1200
Kaiser Alumina*	lb.	.026	.059
Aluminum Silicate			
Aluminum Flake*	ton	23.50	30.00
Marter White*	ton	18.50	30.00
Barium Carbonate (l.c.l.)	ton	95.50	100.00
Barytes			
No. 1 Floated, White*	ton	45.00	65.10
No. 2 Floated, Un-bleached*	ton	43.00	63.10
No. 22 Barytes* (c.l.)	ton	——	25.00
No. 3805 Barytes*	ton	22.00	26.75
Foam A*	ton	——	45.00
Sparmite*	ton	80.00	85.00
XIOR*	ton	75.00	80.00
Bentonite (c.l.)	ton	——	13.50
Argosite Clay* (c.l.)	ton	——	12.50
Bennett Clay* (c.l.)	ton	——	32.50
SPV Volclay* (c.l.)	ton	——	12.50
White Hi-Gel*	ton	——	65.90
Blanc Fixe	ton	72.50	120.00
Calcium Carbonate			
Atomite* (c.l.)	ton	——	32.50
B.I. White No. 1 (c.l.)	ton	——	9.00
Caleene NC*	ton	72.50	92.50
TM*	ton	75.00	95.00
Calwhite*	ton	——	20.00
Camel-Carb*	ton	——	12.00
Camel-Tex*	ton	——	20.00
Camel-Wite*	ton	——	32.50
Duramite*	ton	——	36.00
Gamaco* (c.l.)	ton	——	32.50
Georgia Marble 5-25* (c.l.)	ton	——	20.00
No. 10 White* (c.l.)	ton	——	11.00
Kalite*	ton	50.00	65.00
Keystone White*	ton	——	18.00
Laminar*	ton	——	30.00
Lesamite* (c.l.)	ton	——	27.50
Lorite*	ton	30.00	35.00
Millical*	ton	38.00	53.00
Multifex MM*	ton	110.00	125.00
Non-Fer-Al*	ton	32.50	37.50
Purecal M*	ton	56.75	80.75
SC*	ton	110.00	125.00
T*	ton	110.00	125.00
U*	ton	120.00	135.00

FILLERS (Cont'd)

Calcium Carbonate (cont'd)			
Rambo No. 1*	ton	——	10.50
Snowflake*	ton	17.00	20.00
Super Multifex*	ton	160.00	175.00
Surfex*	ton	37.50	52.50
Suspenso*	ton	35.50	50.50
Witcarb Reg.*	ton	56.75	85.00
P*	ton	110.00	140.00
R*	ton	120.00	150.00
RC*	ton	110.00	140.00
York White*	ton	——	9.50
Calcium Silicate			
Silene EF*	ton	120.00	140.00
Calcium Sulfate, Anhydrous			
Snow White Filler*	ton	——	20.50
Calcium Sulfate Hydrous			
Terra Alba No. 1*	ton	——	16.00
Chalk Whiting (l.c.l.)	lb.	.01½	.01¾
Recco Paris Whiting*	ton	——	33.00
OMYA Whiting*	ton	——	30.00
Clay			
Afton Clay*	ton	11.00	30.00
Aiken Clay*	ton	——	13.00
Alsilite* (c.l.)	ton	30.00	45.00
Alsite* (c.l.)	ton	——	14.00
Aluminum Flake*	ton	23.50	30.00
Buca* (c.l.)	ton	——	45.00
Burgess No. 20*	ton	——	35.00
No. 30*	ton	——	37.00
Burgess Iceberg*	ton	——	50.00
Catalpo* (c.l.)	ton	——	35.00
Champion*	ton	——	14.00
C.S.D.* (c.l.)	ton	——	13.50
Crown*	ton	——	14.00
Dixie* (c.l.)	ton	——	14.00
Franklin Clay—R* (c.l.)	ton	13.50	30.00
G. K. Soft*	ton	11.00	28.00
Harwick Clays*	ton	14.50	57.00
Hi-White R*	ton	——	13.50
Kaolinod Clay* (c.l.)	ton	——	10.50
LGB*	ton	——	17.00
LGP*	ton	——	19.00
McNamee* (c.l.)	ton	——	13.50
Natka 1200 (c.l.)	ton	——	12.00
Par* (c.l.)	ton	——	11.00
Paragon*	ton	——	13.50
Pigment 5*	ton	23.50	26.50
33*	ton	——	37.00
Recco* (c.l.)	ton	——	14.00
Swanee Clay*	ton	——	12.50
Snobrite*	ton	——	12.50
Suprex*	ton	——	14.00
Whitetex* (c.l.)	ton	——	50.00
Windsor Clay* (c.l.)	ton	13.00	30.00
4200 Clay*	ton	——	11.00
Diatomaceous Earth	ton	30.00	50.00
Kaylorite* (c.l.)	ton	——	30.00
Lorite*	ton	——	30.00
Flock			
Cotton (White)	lb.	.28	.32
Colored	lb.	.11	.19
Filfloc F 40-9000*	lb.	——	.13
F 6000*	lb.	——	.36
Polycel*	ton	110.00	210.00
Rayon, Bleached or Dyed	lb.	.75	1.20
Rayon, Grey	lb.	——	.18
Rayon, Pink	lb.	——	.20
Solka-Floc* (l.c.l.)	lb.	.07	.16
Glue, Amber	lb.	.17	.19
Ground Softwood Bark			
Silvacon* (c.l.)	ton	55.00	100.00
Leather			
Flour (dust)	lb.	.12	.15
Shredded	lb.	.05	.17
Lignin	lb.	.06	.08
Indulin*	lb.	.06	.08
Limestone, Pulverized	ton	3.00	5.00
Asbestol Regular*	ton	27.00	29.00
Asbestol Superfine*	ton	32.00	34.00
Georgia Marble No. 10*	ton	——	11.00
Industrial Filler No. 100*	ton	——	5.75
Micro Velva A*	ton	49.00	51.00
L*	ton	57.00	59.00
No. 1 White*	ton	——	10.00
Magnesium Carbonate	lb.	.10½	.14¼
K & M Clearcarb*	lb.	——	.14
Technical* (c.l., eqld.)	lb.	.10½	.12
Magnesium Silicate (see Talc)			
Mica	lb.	.01¼	.07¾
Concord*	lb.	.07½	.08¼
Micro-Mica*	lb.	.07½	.08¼
Mineralite* (c.l.)	ton	40.00	85.00
Silversheen*	lb.	.08	.08¼
Triple A Mica* (c.l.)	ton	——	25.00
Vermiculite*	lb.	——	.11
Wet Ground Biotite Mica	lb.	.06	.06¾
Wet Ground Mica No. 160*	lb.	.07½	.08¼
Pecan Shell Flour			
Stan Shell*	ton	45.00	75.00
Pyrophyllite			
No. 261*	ton	——	11.50
Pyrax A* (c.l.)	ton	——	13.50
WA* (c.l.)	ton	——	16.00
Sawdust, Graded	ton	14.00	35.00
Silica	ton	16.00	27.00
DC Silica (pelleted)	lb.	1.45	1.65
Extra Fine (bags) (c.l.)	ton	——	43.00
Slate, Powdered (l.c.l.)	ton	15.00	20.00
Lo-Micron Slate Flour*	lb.	——	.04½
No. 133 Slate Flour*	ton	——	4.55
Sodium Silico Aluminate			
Zeolex 23*	ton	120.00	140.00

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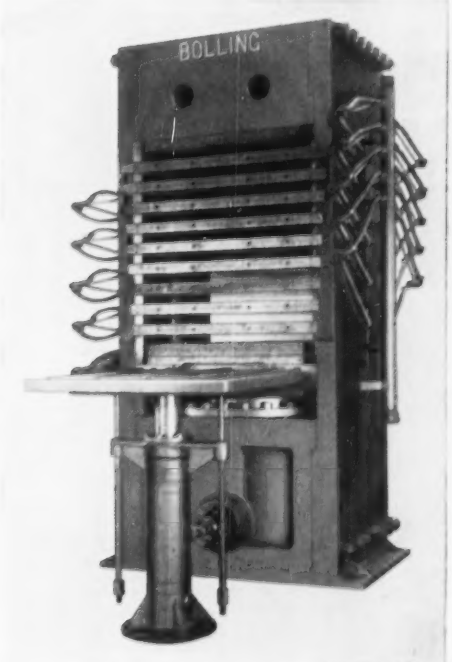

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Meet close tolerances with a Bolling slabside press. Bolling slabside design places strength where needed in order to avoid deflection and assure the highest percentage of usable production. Bolling slabside presses are available from 20"x20" through 48"x48". The tonnage span is from 100 to 1250. Bolling also designs and builds a complete range of 4-bolt presses, full- and semi-ring presses, hydraulic pumping units and lift tables.

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Write for descriptive literature A-8

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B INTENSIVE MIXERS • MILLS • CALENDERS • REFINERS • CRACKERS
HYDRAULIC PRESSES • PUMP UNITS • BALE SLITTERS • SPEED-REDUCERS

FILLERS (Cont'd)

Talc (Magnesium Silicate)			
Asbestol Regular*	ton	—	25.00
Eastern RC-500*	ton	—	30.00
No. 41*	ton	—	17.70
No. 549*	ton	—	63.00
French*	ton	—	59.00
I. S. Silver*	ton	32.75	37.75
No. 367*	ton	—	13.00
No. 1600*	ton	—	70.60
No. 1768*	ton	—	13.00
Nytal 200* (c.l.)	ton	—	27.00
300* (c.l.)	ton	—	37.00
Sierra White*	ton	19.75	30.75
Soapstone*	ton	—	13.00
Walnut Shell Flour	ton	55.00	100.00
Stan-Shell*	ton	40.00	80.00
Whiting, Commercial	ton	—	7.50
Allied Whiting*	ton	10.50	21.50
Camel-Carb*	ton	—	10.00
Calwhite (c.l.)	ton	—	20.00
C-C-O White*	ton	—	19.00
Georgia Marble No. 15*	ton	—	20.00
No. 16*	ton	—	20.00
Keystone* (c.l.)	ton	18.00	20.00
Pigua No. 1 YAA* (c.l.)	ton	—	9.00
No. 2 LS* (c.l.)	ton	—	9.00
Snowflake* (c.l.)	ton	—	20.00
Stan-White 325*	ton	10.50	13.10
Vero* (c.l.)	ton	—	10.50
Welco* (c.l.)	ton	—	10.50
York White R* (c.l.)	ton	—	9.00
Wood Flour	ton	31.50	48.00

FINISHING MATERIALS, SURFACE

Beaco Finishes*	gal.	2.10	2.35
Black Out*	gal.	4.50	8.00
Shellac, Orange Gum	lb.	.50	.60
VanWax*	gal.	1.45	1.50

FLAME RETARDANTS

Cellufiex CEF* (dms.)	lb.	—	.65
Chlorowax 50*	lb.	.16¾	.17¾
70*	lb.	.18½	.20
Halowax*	lb.	.35½	.61½
Zinc Borate 3167*	lb.	.1920	.2020
Zyrox Compounds*	lb.	.38	.95½

LATEX MODIFIERS

Ludox	lb.	.15	.16¾
OPD-101*	lb.	—	.26
202*	lb.	—	.29
Ubatol U-2001* (dms.)	gal.	1.58	1.67

LUBRICANTS, MOLD

Akro Gel*	lb.	—	.165
Alipal CO-433*	lb.	—	.20
CO-436*	lb.	—	.24
Aluminum Stearate Crown Brand*	lb.	.37	.42
Amine, Mixed Crude*	lb.	.21	.25
Amine Residue*	lb.	.07½	.09½
Aquadag*	lb.	3.50	4.00
Aquarex D*	lb.	—	.78
L*	lb.	—	.94
ME*	lb.	—	.80
MDL*	lb.	—	.33
WAQ*	lb.	—	.22
Armeen HT*	lb.	.36	.40
18D*	lb.	.52	.56
Armid HT (flaked)*	lb.	.32	.36
O*	lb.	.39	.41
Borax, Granular (l.c.l.)	ton	89.00	94.00
Carbowax 4000*	lb.	.31	.32
CD Mold Release B*	gal.	5.00	—
B-2*	gal.	5.00	—
Colite Concentrate* (dms.)	gal.	.90	1.15
Colite D43D*	gal.	1.15	1.40
Concentrex*	lb.	—	.25
Dag Dispersions No. 197*	lb.	1.85	2.90
D.C. 7 Compound*	lb.	5.13	6.50
D.C. Emulsion No. 7*	lb.	1.59	2.07
No. 8*	lb.	1.26	1.80
No. 35*	lb.	1.26	1.80
No. 35A*	lb.	1.26	1.80
No. 35B*	lb.	1.26	1.80
No. 36*	lb.	1.26	1.80
D.C. Mold Release Fluid*	lb.	3.14	4.75
Dri-Lube*	lb.	—	.22
Emulsion Lubricant A80*	lb.	—	1.80
45*	lb.	—	1.80
G-E Silicone Emulsion SM-55*	lb.	1.26	1.80
SM-61*	lb.	1.36	1.55
SM-62*	lb.	1.26	1.80
G-E Silicone Fluid SF-92*	lb.	3.39	5.00
SF-96*	lb.	3.14	4.25
Glydag G*	lb.	1.30	2.45
Hawkeye Flake* (dlvd.)	lb.	.15	.15¼
HSC No. 35*	lb.	1.22	2.46
No. 515	lb.	1.22	2.46
Igepal CO-430*	lb.	—	.29
CO-630*	lb.	—	.29
CO-530*	lb.	—	.29
Igepon AP-78*	lb.	—	.48
T-51*	lb.	—	.13½

LUBRICANTS, MOLD (Cont'd)

Kokobace R*	lb.	.17½	.18½
Lubrex	lb.	.25	.30
Lubri-Flo*	gal.	10.00	12.00
Migralube*	lb.	—	.35
ML-1027-2C*	gal.	—	2.15
ML-1028-2C*	gal.	—	2.15
Mold Lubricant No. 72 Conc.* (dms.)	gal.	—	1.90
No. 735* (dms.)	gal.	—	1.25
No. 769* (dms.)	gal.	—	1.20
No. 825* (dms.)	gal.	—	1.90
No. 856* (dms.)	gal.	—	1.90
No. 880* (dms.)	gal.	—	1.12
No. 887* (dms.)	gal.	—	1.75
No. 896* (dms.)	gal.	—	1.26
No. 935* (dms.)	gal.	—	1.60
No. 956* (dms.)	gal.	—	2.50
No. 965* (dms.)	gal.	—	2.05
No. 967* (dms.)	gal.	—	2.40
No. 969* (dms.)	gal.	—	1.55
No. 975* (dms.)	gal.	—	2.90
No. 980* (dms.)	gal.	—	1.55
No. 987* (dms.)	gal.	—	2.90
Moldeze No. 3*	gal.	5.00	6.00
Mold-Brite*	gal.	—	1.50
Monopole Oil MD*	lb.	—	.16
Olate Flakes*	lb.	.22¾	.23¼
Orvus WA Paste* (dms.)	lb.	—	.22
Plaskon Polyethylene S*	lb.	.32	.47
Polyglycol 15-200*	lb.	.25	.28¼
E4000*	lb.	.31	.37
Prodag*	lb.	.28	.42
Purity Flake* (dlvd.)	lb.	.18	.19¼
Rubber-Flo*	gal.	1.25	2.00
Rubber-Glo*	gal.	—	.94
Rusco Mold Paste*	lb.	—	.25
Sericite* (l.c.l.)	ton	65.00	75.00
Silicone Oil A145*	lb.	3.18	3.61
A65*	lb.	2.50	2.75
Soybean Lecithin	lb.	.13	.17
Thermalube*	lb.	—	.13¼
UC Silicone L-45*	lb.	3.14	4.75
LE-45*	lb.	1.26	2.50
Ucon Lubricants*	lb.	.26¾	.27¼
Ulco Mold Soap*	lb.	.15	.29

LUBRICANTS, RUBBER

Diglycol Stearate Neutral (and SE) (dms.)	lb.	—	.25
Extrud-o-Lube*	gal.	—	1.54
G.B. Naphthenic Neutrals*	gal.	.11	.18
Ivory Chips*	lb.	.18½	.19¼
Latex-Lube GR* (dlvd.)	lb.	.19¼	.20
No. 82-A* (450 lb. dms.)	lb.	—	.08½
Propylene Stearate (dms.)	lb.	.35	.60

LUBRICANTS, RUBBER SURFACE

Barium Stearate	lb.	.39	.44
Calcium Stearate	lb.	.37	.42
Crown Brand*	lb.	.37	.42
D.C. 4 Compound*	lb.	5.13	6.50
D.C. 200 Fluid*	lb.	3.14	4.75
ELA*	lb.	—	.82
G-E Silicone Fluid SF-92*	lb.	3.39	5.00
Glycerized Lubricant*	gal.	—	1.48
Glydag B*	lb.	1.50	2.10
G*	lb.	1.30	2.45
HSC No. 35*	lb.	1.28	1.34
No. 515*	lb.	1.28	1.34
Hydro-Zinc*	lb.	—	.20
Latex-Lube Pigmented* (dlvd.)	lb.	.17¼	.18¼
R-66*	lb.	—	.16½
Liqui-Lube* (dlvd.)	lb.	—	.16¼
N.F.* (dlvd.)	lb.	—	.16¾
N.T.* (dlvd.)	lb.	—	.16¾
Lubrex*	lb.	.25	.30
Magnesium Stearate Crown Brand*	lb.	.40	.45
Polyethylene Glycol	lb.	.22	.26
Rubber Free (Concentrate)*	gal.	—	1.44
Jel*	lb.	.18	.21½
Slab-Dip*	lb.	.16	.18½
Soybean Lecithin	lb.	.13	.17
Stock-Lube*	lb.	—	.19
UC Silicone L-45*	lb.	3.14	4.75
Zinc Stearate	lb.	.39	.44

MOLD CLEANERS

Actusol* (dlvd.)	gal.	1.45	1.65
Alkon* (dlvd.)	lb.	.16	.16½
CA-301*	gal.	—	2.49
CA-302*	gal.	—	2.63
G-O 6910*	lb.	.38	.40
Metso Anhydrous*	cwt.	5.35	7.60
Metso 99*	cwt.	4.80	7.05
200*	cwt.	6.30	8.55
Granular*	cwt.	4.10	6.35
Orvus Extra Granules*	lb.	.22½	.23½
Rubber-Sol*	gal.	2.97	3.97
Sprex A.C.* (dlvd.)	lb.	.17¼	.18¾
Zip Mold Cleaner*	gal.	.95	1.45

PEPTIZING AGENTS

Peptizer P-12*	lb.	.95	1.25
Pepton 22 Plasticizer*	lb.	.79	.82
RPA 2*	lb.	—	.78
3*	lb.	—	.47
3 Conc.*	lb.	—	.83
5*	lb.	—	.59
6*	lb.	—	1.58

PLASTICIZERS & SOFTENERS

Acto 500*	lb.	—	.09
Adipol BCA*	lb.	.47	.47½
2EH*	lb.	.42½	.45½
10A*	lb.	.42½	.45½
ODY*	lb.	.47	.50
810*	lb.	.42½	.45½
XX*	lb.	.42½	.45½
Anhydrol 6990*	lb.	.51	.56
Arneel*	lb.	.27	.39
SD*	lb.	.36	.40
Arolene 1980* (c.l.)	lb.	—	.10
Aromatic Plasticizer 10* (and 25*) (dms.)	lb.	.05	.06½
Aromatic Tar	gal.	.0573	.1973
Bardol*	lb.	.02¼	.03¼
B*	lb.	.06¼	.06½
Bayol D*	gal.	—	.382
F*	gal.	—	.52
Beeswax, Bleached	lb.	.80	.83
Yellow, Refined	lb.	.75	.80
Bondogen*	lb.	.55	.60
B.R.C. No. 20*	lb.	.0150	.0175
No. 21*	lb.	.02¼	.03
No. 22*	lb.	.02½	.02¾
B.R.H. 2*	lb.	.0213	.0351
BRS 700*	lb.	.0200	.0285
B.K.T. 3*	lb.	.0180	.0265
4*	lb.	.0250	.0260
7*	lb.	.0300	.0310
B.R.V.*	lb.	.0475	.0565
Bunarex Resins*	lb.	.07	.08
Bunatak AH*	lb.	—	.09½
N*	lb.	—	.31
U*	lb.	—	.17½
No. 90*	lb.	—	.09
No. 210*	lb.	—	.14
Butac*	lb.	.12½	.13½
BxDC (dms.)	lb.	.40	.41
Butyl Carbitol Perlargonate (dms.)	lb.	—	.64½
Butyl Cellosolve Perlargonate (dms.)	lb.	—	.68
Butyl Oleate	lb.	.23¼	.26
Butyl Palmitate	lb.	—	.26½
Butyl Stearate (dms.)	lb.	.22¼	.24½
BWH-1*	lb.	.16	.17
Cabflex DDA*	lb.	.42½	.45½
DDP*	lb.	.30½	.33½
Di-BA*	lb.	.43¼	.46¼
Di-OA*	lb.	.42½	.45½
Di-OP*	lb.	.30½	.33½
Di-OZ*	lb.	.48	.51
DOA*	lb.	.42½	.45½
DOP*	lb.	.30½	.33½
HS-10	lb.	.44	.47
ODA*	lb.	.42½	.45½
ODP*	lb.	.30½	.33½
TCP*	lb.	.34½	.37½
Califlux 510* (and 550*)	lb.	.02½	.03¼
G.P.*	lb.	.01¼	.02
R-100*	lb.	.04½	.05¼
TT*	lb.	.0170	.0245
Candelilla Wax, Prime	lb.	—	.64
Refined Light	lb.	.55	.58
Carbowax 4000* (dms.)	lb.	.31	.32
Carnauba Wax, Crude	lb.	.60	.62
Flaked	lb.	.75	1.20
Refined, Technical	lb.	.65	.68
Refined, Pure	lb.	.75	.80
Yellow	lb.	—	1.35
Cellufiex* (dms.) 112* (t.c., dlvd.)	lb.	—	.34½
179-A* (t.c., dlvd.)	lb.	—	.34½
179-C* (t.c., dlvd.)	lb.	—	.34½
179-EG* (t.c., dlvd.)	lb.	—	.34½
DBP* (t.c., dlvd.)	lb.	—	.30
DOP* (t.c., dlvd.)	lb.	—	.30½
TPP* (dms., eqld.)	lb.	—	.40
Ceresin Wax	lb.	.11½	.28
Chlorowax 40*	lb.	.15¼	.17¼
50*	lb.	.16¾	.17¾
70*	lb.	.18½	.20
LV*	lb.	.17¼	.19¼
CTLA Polymer*	gal.	.20	.36
Cumar Resins*	lb.	.07	.19
Darex DBP*	lb.	.30	.33
DOP*	lb.	.30½	.33½
DIOP*	lb.	.30½	.33½
D.B.M.*	lb.	.32	.34¼
Decylbutyl Phthalate	lb.	.27	.30
Degras, Common	lb.	—	.14
Diallyl Phthalate	lb.	.49¾	.52¼
Dibenzyl Sebacate	lb.	.88	.89½
Dibutoxyethyl Sebacate	lb.	—	.56¾
Dibutyl Phthalate	lb.	.30	.32½
Dibutyl Sebacate	lb.	.64½	.65½
Dicapryl Adipate	lb.	.42	.44
Dicapryl Phthalate	lb.	.29½	.31
Dicapryl Sebacate	lb.	.58	.59½
Di-Carbitol Phthalate (dms.)	lb.	.42	.42½
Dicyclohexyl Phthalate	lb.	.58¼	.59¼
Diethyl Phthalate (t.c.)	lb.	.25	.27¼
Di-2-ethylhexyl Phthalate	lb.	—	.30½
Dihexyl Adipate	lb.	.40	.42½
Dihexyl Phthalate	lb.	.30	.32½

The Important Qualities You Want In MAGNESIUM OXIDE For Rubber or Neoprene Compounding are AVAILABLE in DCI LIGHT CALCINED MAGNESIA

(Powdered or Granular)

REQUIREMENTS

★ MgO with low Fe_2O_3, Al_2O_3 and CaO content
★ Uniformity
★ Controlled Particle Size
★ Dust-free Grains
★ Lowest Manganese Content
★ Protective Packaging

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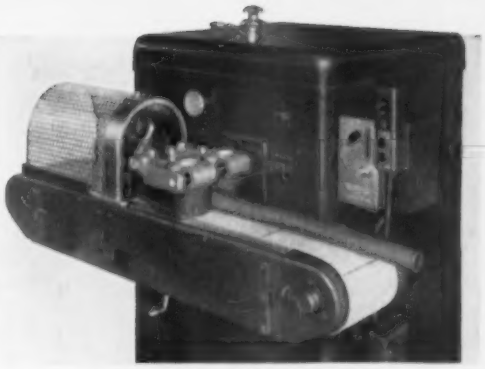

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WINK cuts any extruded material, speeds being controlled automatically to equal extruding speeds; 3000 pieces per minute are possible. Right off the belt, WINK cuts lengths of 100 feet and more from 3" dia. down to thin 1/16" slices on 1/2" dia. stock; *no distortion or collapse.* Set-up time negligible; short runs practical. Waste reduced up to 90%.

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BRATEX

RUBBER HOLLAND

BRATEX is available in three standard qualities, 20 and 40 inch widths, 100 and 250 yard rolls. Special size rolls to order.

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NEW YORK • PHILADELPHIA • CHICAGO • MILWAUKEE • SAN FRANCISCO

PLASTICIZERS & SOFTENERS (Cont'd)

Dihexyl Sebacate	lb.	.62	.63½
Diisobutyl Azelate	lb.	—	.47¾
Di-iso-octyl Adipate	lb.	.40	.42½
Di-iso-octyl Phthalate (t.c.)	lb.	.30½	.32
Dimethyl Phthalate (t.c.)	lb.	.27½	.30¾
Dimethyl Sebacate	lb.	1.25	1.26½
Dinonyl Adipate	lb.	.44½	.47½
Dinopol 235*	lb.	.35½	.38½
IDO*	lb.	.30½	.33½
MOP*	lb.	.32½	.35½
Dioctyl Adipate	lb.	.40	.42½
Dioctyl Phthalate (dms.)	lb.	.30½	.33
Dioctyl Sebacate (dms.)	lb.	.58	.59½
D.I.O.P. (dms.)	lb.	.30½	.33½
Dipolymer Oil	gal.	.33	.48
Dispersing Oil No. 10*	lb.	.06	.06¼
Dutrex 6*	gal.	—	.11
15E*	gal.	—	.10
Elastex 10-P*	lb.	.30½	.33½
50-B*	lb.	.25	.28
DCHP*	lb.	.59	.60
Emulphor EL-719*	lb.	—	.58
Epoxy Plasticizer	lb.	.33½	.36
Drapex 3.2*	lb.	.40	.45
Drapex 4.4*	lb.	.37	.42
Esparto Wax	lb.	—	.33
Estac*	lb.	—	.16
Facile Gum 4A*	lb.	.48	.50
Flexol B-400*	lb.	.27	.28
DOP*	lb.	.32½	.33½
TOP*	lb.	.45½	.46½
3GH*	lb.	.45½	.46
3GO*	lb.	.54½	.55
4GO*	lb.	.34½	.35½
426*	lb.	.29	.30
Flexricin P-1*	lb.	—	.32
P-4*	lb.	—	.31
P-6*	lb.	—	.37
P-8*	lb.	—	.33
Fortex* (dms.)	lb.	.12½	.14½
Galex W-100*	lb.	.15½	.19¾
G.B. Asphaltic Flux*	gal.	.10	.18
G.B. Light Process Oil*	lb.	.02½	.03¼
Medium Process Oil*	lb.	.03½	.04¼
G.B. Naphthenic Neutrale*	gal.	.11	.18
Good-rite GP233*	lb.	.44¼	.47¼
GP235*	lb.	.42½	.45½
GP236*	lb.	.42½	.45½
GP261*	lb.	.34	.37
GP265*	lb.	.30½	.33½
GP266*	lb.	.30½	.33½
Harflex 500* (dms.)	lb.	.31½	.34
Herron-H.T.*	gal.	.16	.27
Herron-Plas*	lb.	—	.03¼
Herron-Wax*	lb.	.05¼	.06
No. 23*	lb.	.08¼	.08¼
No. 24*	lb.	.07¼	.07¼
HSC No. 13*	lb.	.20	.27
No. 28 and 38*	lb.	.20	.27
Indonex 632½* (633½*, 634½*, 637½*)	gal.	.11	.17
Isooctyl Decyl Phthalate	lb.	.30½	.33½
Kapsol*	lb.	.32¼	.35¼
Kenflex*	lb.	.18	.27
Kenseoflex 101* (dms.)	lb.	—	.37½
103* (dms.)	lb.	—	.38
MCO* (dms.)	lb.	—	.35½
BCL* (dms.)	lb.	—	.37½
MCP** (dms.)	lb.	—	.41
BCP** (dms.)	lb.	—	.36
KP 23*	lb.	.29	.32
90*	lb.	.40	.43
140*	lb.	.46	.48½
201*	lb.	.58¼	.59¼
220*	lb.	.31	.34
555*	lb.	.45	.47½
Kremol 40*	gal.	.36	.46
50*	gal.	.39	.49
Kronisol* (dms.)	lb.	.33	.36
Kronitex AA* (dms.)	lb.	.34½	.37½
I* (dms.)	lb.	.34½	.37½
K-3*	lb.	.34½	.37½
MX*	lb.	.34½	.37½
Lanolin, Tech. Anhydrous	lb.	—	.26
Latex-Lube G.R.*	lb.	.19¾	.20
Lead Oleate	lb.	—	.30½
Lindol* (dms., t.c.)	lb.	.34½	.37½
Locusol No. 1-6980*	lb.	.30	.34
2-Mercaptoethanol (dms.)	lb.	1.25	1.50
Methox*	lb.	.38½	.41
Methyl Laurate	lb.	.25	.27
Methyl Oleate	lb.	—	.20
Methyl Stearate (dms.)	lb.	—	.30
Monoplex S-71*	lb.	.46½	.47½
Montan Wax, Crude	lb.	.21	.27
Flaked	lb.	.27	.29
Morflex*	lb.	.32	.69½
MR 2088* (dms.)	lb.	—	.19
Natac*	lb.	.12	.13
Nebony Resins* (dms.)	lb.	.04½	.07¼
Neolene 210* (t.c.)	lb.	—	.16
212* (t.c.)	lb.	—	.14
220* (t.c.)	lb.	—	.15
Nerium*	lb.	—	.09
Nevillac Resins* (dms.)	lb.	.31	.85
Neville LX-880* (dms.)	lb.	.12	.13½
LX-685* (dms.)	lb.	.12½	.17½
Neville Resins* (dms.)	lb.	.07½	.20
Nevindene Resins* (dms.)	lb.	.16½	.20
Nevinol* (dms.)	lb.	—	.24
Nuba 1* (and 2*) (dms.)	lb.	.06¼	.06¼
3X* (dms.)	lb.	.07¼	.08¼
No. 480 Oil Proof Resin*	lb.	—	.18
Ohopex Q10* (dms.)	lb.	.29½	.32½
R9* (dms.)	lb.	.35½	.37¼

PLASTICIZERS & SOFTENERS (Cont'd)

Ortho-Nitrobiphenyl	lb.	.13	.15
Ozokerite Wax, White and Yellow	lb.	.24	.31
Paradene Resins (dms.)	lb.	.07½	.08
Para Flux* (dms.)	gal.	.19¼	.20¾
2016* (dms.)	gal.	.22	.23
Para Lube* (l.c.l.)	lb.	.046	.048
Paraplex G-40*	lb.	.50	.51
G-50*	lb.	.40¾	.41¾
G-51*	lb.	.45	.46
G-60*	lb.	.35	.36
G-62*	lb.	.37½	.38½
Parmo*	lb.	.06	.13½
Pepton 22 Plasticizer*	lb.	.79	.82
PG-16*	lb.	—	.35
Philrich 5* (t.c.)	gal.	—	.11
Picco 10* (and 25*)	lb.	.15	.17
60* (and 75*)	lb.	.15	.17
100*	lb.	.15	.17
Piccocizer 30*	lb.	.05½	.07
Piccolastic A* (B*, C*, D* & E*)	lb.	.28	.29
FT* (FHF* & FX*)	lb.	.1815	.1965
T-135*	lb.	.22¼	.23¼
Piccolyte S Resins*	lb.	.20½	.22¼
Piccopale Resins*	lb.	.12	.13
Piccoumaron Resins*	lb.	.07	.24½
Pigmentar*	lb.	.0460	.0745
Pigmentarol*	lb.	.0460	.0745
Plastac M*	lb.	—	.09¾
Plasticizer 2286*	lb.	—	.26¼
Plasticizer 4141*	lb.	.56¾	.66¾
Plasticizer DP-200, DP-250, DP-520*	lb.	.42¼	.46¼
Plasticizer MT-511*	lb.	—	.68¾
Plasticizer ODN*	lb.	.34	.40
Plasticizer SC*	lb.	.50	.51
Plasticizer W-13*	lb.	.37	.38¾
Plastoflex 3*	lb.	—	.52
50*	lb.	.34¼	.35¼
55*	lb.	.31	.32
520*	lb.	.37½	.38½
SP-2*	lb.	—	.43
VS*	lb.	.41¼	.42¼
Plastogen*	lb.	.07¾	.08
Plastolein 9050* (c.l.)	lb.	.54	.56
9055*	lb.	.30	.32
9058*	lb.	.50	.52
9250*	lb.	.37½	.39½
9715*	lb.	.42½	.45½
Plastone*	lb.	.23	.27
Polycizer 162*	lb.	.30½	.33
332*	lb.	.40	.42½
562 and 662*	lb.	.30½	.33
632 and 632*	lb.	.40	.42½
ED*	lb.	—	.51
Polyco 438*	lb.	.34	.35
Polymel C-130*	lb.	.19½	.20½
D*	lb.	.23½	.24½
6*	lb.	.05¾	.07¾
Process Oil C-255* (c.l.)	gal.	—	.22
Propylene Stearate (dms.)	lb.	—	.32
FRR 1*	gal.	.15	.35
PT 67 Light Pine Oil* (dms.)	gal.	—	.60
101 Pine Tar Oil* (t.c., dms.)	gal.	.0460	.0634
400 Pine Tar* (600* & 800*) (t.c., dms.)	lb.	.0460	.0634
PX-104*	lb.	.32	.33
PX-108*	lb.	.32½	.33½
PX-138*	lb.	.32½	.33½
PX-208*	lb.	.44½	.45½
PX-238*	lb.	.44½	.45½
PX-404*	lb.	.66	.67
PX-438*	lb.	.60	.61
PX-800*	lb.	.34	.35
PX-917*	lb.	.36½	.37½
Reogen*	lb.	.13¼	.13½
465 Resin* (dms.)	lb.	.07½	.08
Resin C*	lb.	.0225	.0310
Resinex*	lb.	.03½	.04¼
L-4*	lb.	.02¾	.03¼
Rexflex*	lb.	—	.15
Rosin Oil	gal.	.80	1.35
RR-10 (Neoprene)*	lb.	—	.36
R.S.O. Softening Oil*	lb.	.03	.05
RuBars*	lb.	.19¾	.20
Rubberol*	lb.	—	.25½
Santicizer B-16*	lb.	.48¼	.49¼
E-15*	lb.	.52¼	.53¼
M-17*	lb.	.44¼	.45¼
No. 140*	lb.	.36½	.37½
No. 141*	lb.	.36	.37
No. 160*	lb.	.28½	.29½
No. 602*	lb.	—	.30½
No. 603*	lb.	—	.27
Sherolatum*	lb.	.03½	.06
Staflex DBES*	lb.	.58	.60½
DOS*	lb.	.58	.60½
TXA*	lb.	.32	.35
KA*	lb.	.36	.38¼
Stan Chlor Oils*	lb.	.13½	.20½
70*	lb.	.17½	.30
Stanolind Petrolatum*	lb.	.07	.156
Wax*	lb.	.31	.33
Sunny South Burgundy Pitch*	lb.	.1030	.1085
Pine Tar*	lb.	.0460	.0801
Pine Tar Oil*	lb.	.0460	.0745
Rosin Oil*	gal.	.58	.87½
Superla Wax*	lb.	.30	.397
Syncera Wax*	lb.	.16	.267
Syn Tac* (c.l.)	gal.	—	.33
Synthetic Revertant Oil	lb.	—	.16
Tar, Refined	gal.	.1200	.1760
Terpene A*	gal.	—	.65
TP-90B*	lb.	.59	.69

PLASTICIZERS & SOFTENERS (Cont'd)

TP-95*	lb.	.65	.75
Transphalt Resins*	lb.	.02¼	.04¼
Tributyl Phosphate	lb.	.50	.53
Tricresyl Phosphate	lb.	.34½	.37½
Turgum S*	lb.	.10¾	.11¾
Vanadiset B*	lb.	.036	.07
C*	lb.	.031	.06
MR 80 Mesh*	lb.	.08½	.12½
Vistac No. 1*	gal.	1.00	1.21
P*	lb.	.18	.18½
Vopcolene 50*	lb.	—	.37
Witcizer 100*	lb.	.26	.27
200*	lb.	.26	.27
201*	lb.	.22¾	.25½
300*	lb.	.30	.33
312*	lb.	.30½	.33½
313*	lb.	.30½	.33½
412*	lb.	.42½	.45½
Witresin*	ton	50.00	57.50

PROCESSING AIDS

Castor Oil, Blown (dms.)	lb.	—	.21
Refined (dms.)	lb.	—	.18½
Castorwax*	lb.	—	.24½
Dutrex 7*	lb.	.12	.20
ELA*	lb.	—	.82
Hydrofol Glycerides 200*	lb.	.15½	.19¼
Kenflex N*	lb.	—	.18
Maleic Anhydride	lb.	—	.27
Millrex*	lb.	—	.15
Nadic Anhydride	lb.	—	.27
Polycin*	lb.	—	.24½
Resin No. 510*	lb.	.15	.22
Pulverized*	lb.	.20½	.25
Thiomalic Acid	lb.	—	2.50
Zyrox*	lb.	.50	.79

PROTECTIVE & STABILIZING AGENTS

Acacia*	lb.	.12¼	.21
Alpha Protein	lb.	—	.23
Aroostocrat*	lb.	—	.07½
Carob Bean Flour	lb.	—	.40
Casein	lb.	.32	.38
Emcol K-8300* (dms.)	lb.	.14	.18
Ethylene Diamine 68%	lb.	.44	.47
Gum Arabic	lb.	—	.23
Karaya Gum	lb.	—	.35
Locust Bean Gum	lb.	—	.31
Prosein*	lb.	—	.06
Stablex B*	lb.	.50	.95
K*	lb.	.27	.35

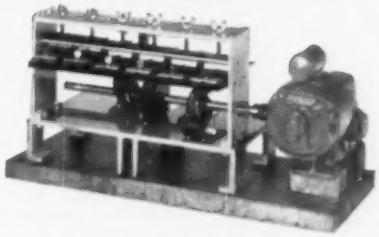
RECLAIMING AGENTS

Amalgamator Z-4*	lb.	.32	.33
Armeen C*	lb.	.45	.47
Mixed Crude*	lb.	.17	.23
T*	lb.	.29	.31
Burco RA*	lb.	.05½	.08¼
C-6 Oil* (28* & 34*)	gal.	.33	.38
C-10 Oil*	gal.	.25	.30
C-33* (t.c.)	gal.	—	.21½
C-42* (t.c.)	gal.	—	.23
Caustic Soda—Flake 76% (c.l., dms.)	cwt.	—	4.50
Liquid 50% (t.c.)	cwt.	—	2.80
Solid 76% (c.l., dms.)	cwt.	—	4.10
Cresylic Acid (99-100%)	gal.	.85	1.39
D-4* (t.c.)	gal.	—	.27
E-5* (t.c.)	gal.	—	.25
Flake Calcium Chloride (77-80%)	ton	—	29.00
G.B. Reclaiming Oil*	gal.	.12	.18
CD-10*	gal.	.10	.16
CD-50-U*	gal.	.18	.24
Gensol No. 6* (t.c.)	gal.	—	.40
Heavy Aromatic Naphtha	gal.	.13¼	.18½
LX-77 Reclaiming Solvent*	gal.	.21	.33
LX-572 Reclaiming Oil*	gal.	.27	.32
LX-777 Reclaiming Oil*	gal.	.23	.33
Neo-Fat D-242*	lb.	.05½	.07¼
42-70*	lb.	.08½	.10¼
No. 517 H.B. Oil*	gal.	.11½	.16½
535*	gal.	.22	.27
PT 67 Light Pine Oil* (dms.)	gal.	—	.60
PT 101 Pine Tar Oil* (t.c., dms.)	gal.	.0460	.0634
PT 150 Pine Solvents* (dms.)	gal.	—	.44
Q Oil* (t.c.)	gal.	—	.286
Reclaiming Oil 3186-G*	gal.	.25	.36½
Reclaiming Reagent No. 1431*	lb.	.21	.25
R.P.A. No. 3*	lb.	—	.47
RR-10*	lb.	—	.36
Soda Ash (c.l., bags)	cwt.	—	1.75
Solvent 534*	gal.	.20½	.26½
Solvent Oil 21*	gal.	.24	.29
C-42*	gal.	.23	.38
Union Solvent 4060-O*	gal.	—	.184
X-1 Resinous Oil*	lb.	.0210	.0300

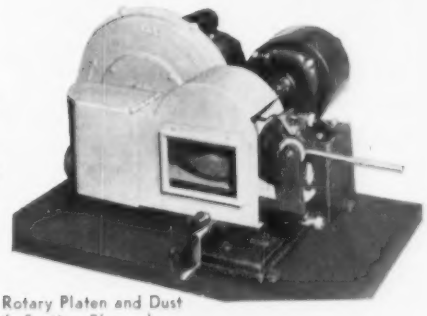
LABORATORY APPARATUS for the RUBBER INDUSTRY

ROSS RUBBER FLEXING MACHINE

(for ASTM D1052)



RUBBER SAMPLE BUFFING MACHINE



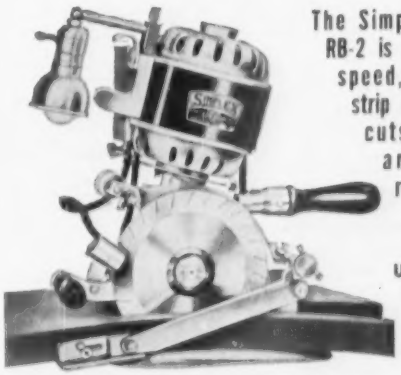
(Shown with Rotary Platen and Dust Collector with Suction Blower.)

EMERSON APPARATUS CO.

183 Tremont St., Melrose, Mass.

SIMPLEX
REG. TRADE MARK

CUT 2500 FEET OF STRIP PER HOUR



The Simplex Model RB-2 is a new high speed, portable strip cutter that cuts efficiently and accurately.

U. S. Patent 2,294,497

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REINFORCING AGENTS—CARBON BLACK

Channel, Hard Processing (HPC) (bags)

Atlantic HPC-98*	lb.	.0700 -	.1225
Continental F*	lb.	.0700 -	.1225
Croflex*	lb.	.0700 -	.1225
Dixiedensed (and S)*	lb.	.0700 -	.1225
HX HPC*	lb.	.0700 -	.1225
Kosmobile (and S)*	lb.	.0700 -	.1225
Micronex HPC*	lb.	.0700 -	.1225
Witco No. 6*	lb.	.0700 -	.1225

Channel, Medium Processing (MPC) (bags)

Arrow MPC*	lb.	.0700 -	.1100
Atlantic MPC-95*	lb.	.0700 -	.1225
Continental A*	lb.	.0700 -	.1225
Croflex TH*	lb.	.0700 -	.1225
Dixiedensed HM (and S-66)	lb.	.0700 -	.1225
Kosmobile HM (and S-66)	lb.	.0700 -	.1225
Micronex Standard*	lb.	.0700 -	.1225
Spheron 6*	lb.	.0700 -	.1225
Texas M*	lb.	.0700 -	.1225
Witco No. 1*	lb.	.0700 -	.1225

Channel, Easy Processing (EPC) (bags)

Atlantic EPC E-42*	lb.	.0700 -	.1225
Collocarb*	lb.	.0590 -	.0990
Continental AA*	lb.	.0700 -	.1225
Croflex 77*	lb.	.0700 -	.1225
Dixiedensed 77*	lb.	.0700 -	.1225
Kosmobile 77*	lb.	.0700 -	.1225
Micronex W-6*	lb.	.0700 -	.1225
Spheron 9*	lb.	.0700 -	.1225
Texas E*	lb.	.0700 -	.1225
Witco No. 12*	lb.	.0700 -	.1225
Wyex EPC*	lb.	.0700 -	.1100

Channel, Conductive (CC) (bags)

Continental R-40*	lb.	.2400 -	.3200
Dixie 5 Dustless*	lb.	.1200 -	.1900
Dixie Voltex*	lb.	.2400 -	.3200
Kosmink Dustless*	lb.	.1200 -	.1900
Kosmos Voltex*	lb.	.2400 -	.3200
Spheron C*	lb.	.1500 -	.1950
Voltex*	lb.	.2400 -	.3200

Channel, Surface Treated (STC) (bags)

Texas 109*	lb.	.0790 -	.1225

Conductive Furnace Black (CF) (bags)

Aromex CF*	lb.	.0800 -	.1200
Continex CF*	lb.	.1000 -	.1400
Shawinigan Acetylene Black*	lb.	.1700 -	.2600
Vulcan C*	lb.	.1050 -	.1500

Furnace, Fast Extruding (FEF) (bags)

Arovel FEF*	lb.	.0600 -	.1000
Collocarb*	lb.	—— -	.0525
Continex FEF*	lb.	.0600 -	.1000
Croflex 50*	lb.	.0600 -	.1000
Dixie 50*	lb.	.0600 -	.1000
Kosmos 50*	lb.	.0600 -	.1000
Philblack A*	lb.	.0600 -	.1000
Statex M*	lb.	.0600 -	.1000
Sterling SO*	lb.	.0600 -	.1000

Furnace, Fine (FF) (bags)

Statex B*	lb.	.0650 -	.1050
Sterling 99*	lb.	.0650 -	.1050

Furnace, General Purpose (GPF) (bags)

Arogen GPF*	lb.	.0500 -	.0900
Dixie 35*	lb.	.0500 -	.0900
Kosmos 35*	lb.	.0500 -	.0900
Sterling V*	lb.	.0500 -	.0900
V (Non-Staining)	lb.	.0500 -	.0900

Furnace, High Abrasion (HAF) (bags)

Aromex HAF*	lb.	.0700 -	.1100
Continex HAF*	lb.	.0700 -	.1200
Croflex 60*	lb.	.0700 -	.1140
Dixie 60*	lb.	.0700 -	.1140
Kosmos 60*	lb.	.0700 -	.1140
Philblack O*	lb.	.0700 -	.1100
Statex R*	lb.	.0700 -	.1200
Vulcan 3*	lb.	.0700 -	.1140

Furnace, High Modulus (HMF) (bags)

Collocarb*	lb.	.0450 -	.0850
Continex HMF*	lb.	.0525 -	.0950
Croflex 40*	lb.	.0525 -	.0950
Dixie 40*	lb.	.0525 -	.0950
Kosmos 40*	lb.	.0525 -	.0950
Modulex HMF*	lb.	.0525 -	.0925
Statex 93*	lb.	.0525 -	.0950
930*	lb.	.0470 -	.0870
Sterling L*	lb.	.0525 -	.0950
LL*	lb.	.0525 -	.0950

REINFORCING AGENTS—CARBON BLACK (Cont'd)

Furnace, Semi-Reinforcing (SRF) (bags)

Collocarb*	lb.	.0420 -	.0820
Continex SRF*	lb.	.0475 -	.0875
Croflex 20*	lb.	.0475 -	.0875
Dixie 20*	lb.	.0475 -	.0875
Essex SRF*	lb.	.0475 -	.0875
Furnex*	lb.	.0475 -	.0875
Gastex*	lb.	.0525 -	.0925
Kosmos 20*	lb.	.0475 -	.0875
Pelletex*	lb.	.0475 -	.0875
NS*	lb.	.0475 -	.0875
Shawinigan Acetylene Black*	lb.	.1700 -	.2600
Sterling NS*	lb.	.0475 -	.0875
R*	lb.	.0525 -	.0925
S*	lb.	.0475 -	.0875

Furnace Super Abrasion (SAF) (bags)

Dixie 85	lb.	.1150 -	.1650
Kosmos 85	lb.	.1150 -	.1650
Philblack E*	lb.	.1150 -	.1550
Vulcan 9*	lb.	.1150 -	.1550

Furnace, Super Abrasion, Intermediate (ISAF) (bags)

Aromex ISAF*	lb.	.0850 -	.1250
Continex ISAF*	lb.	.0850 -	.1350
Dixie 70*	lb.	.0850 -	.1350
Kosmos 70*	lb.	.0850 -	.1350
Philblack I*	lb.	.0850 -	.1250
Statex 125*	lb.	.0850 -	.1350
Vulcan 6*	lb.	.0850 -	.1300

Furnace, Super Conductive (SCF) (bags)

Vulcan SC*	lb.	.1800 -	.2230

Thermal, Fine (FT) (bags)

P-33 (c.l.)*	lb.	—— -	.0575
Sterling FT (c.l.)*	lb.	—— -	.0575

Thermal, Medium (MT) (bags)

Shellblack*(†)	lb.	—— -	.0250
Sterling MT (c.l.)*	lb.	—— -	.0400
MT Non-Staining (c.l.)*	lb.	—— -	.0500
Thermax (c.l.)*	lb.	—— -	.0400
Stainless (c.l.)	lb.	—— -	.0500

REINFORCING AGENTS—SILICA

Cab-O-Sil (compressed)*	lb.	.68 -	.75
Cab-O-Sil (uncompressed)*	lb.	.68 -	.75
D. C. Silica (pelletized)*	lb.	1.45 -	1.65
Hi-Sil 101*	lb.	.11 -	.12½
233*	lb.	.09 -	.10¼
X303*	lb.	.40 -	.45
Santocel*	lb.	.62 -	.64

REINFORCING AGENTS—MISCELLANEOUS

Angelo Shellac*	lb.	—— -	.60
Darex Copolymer No 3*	lb.	.47 -	.49
X34*	lb.	.42 -	.44
43G*	lb.	.39 -	.41
Darex Copolymer Latex No. 3 L	lb.	.41½ -	.46
Durez 12687 (and 12707)*	lb.	—— -	.38
Durez 13355*	lb.	—— -	.29
Good-rite Resin 50*	lb.	.39 -	.41
Hystron*	lb.	.39 -	.41
Kralac A-EP*	lb.	.39 -	.41
Lampblack	lb.	—— -	.12
Marbon S and S-1*	lb.	.39 -	.41
8000*	lb.	.39 -	.41
Marmix*	lb.	.39 -	.41
Pliolite Latex 150*	lb.	.35 -	.39
Pliolite Resin-Rubber Masterbatches*	lb.	.33 -	.57
Pliolite NR*	lb.	.93 -	.95
S6B*	lb.	.39 -	.41
Plio-Tuf G85C*	lb.	.52 -	.54
Polyco 220*	lb.	.18¼ -	.19¼
Polypol S-70*	lb.	.22 -	.23

RETARDERS

Benzoic Acid TBAO-2*	lb.	—— -	.44
Dutch Boy Normasal*	lb.	—— -	.46
ESEN*	lb.	.35 -	.37
Good-rite Vultrol*	lb.	.62 -	.64
Harcopol 1183*	lb.	.70 -	.74
Retarder J*	lb.	.62 -	.64
PD*	lb.	.35 -	.37
W*	lb.	—— -	.45
Retardex*	lb.	.47 -	.50

RUBBER SUBSTITUTES

Mineral Rubber

Black Diamond*	ton	50.00 -	60.00
Byerlyte*	ton	50.00 -	57.00
Hard Hydrocarbon (dms.)*	ton	46.50 -	48.50
Herron Flake*	ton	—— -	45.00
Mineral Rubber, Solid	ton	42.50 -	44.50
M. R. No. 38*	ton	50.00 -	60.00

Vulcanized Vegetable Oils

Amberex*	lb.	.29 -	.36
Brown*	lb.	.1310 -	.2200
Car-Bel-Lite*	lb.	.3000 -	.3300
Neophax*	lb.	.1570 -	.2680
Polyrez A and C*	lb.	.12 -	.17
White*	lb.	.1480 -	.2520

Miscellaneous Rubber Substitutes

G.B. Asphaltenes*	lb.	.06 -	.06½
Gilsowax B*	lb.	.09 -	.11
Resin No. 1098 (dms.)	lb.	—— -	.62
No. 1198*	lb.	.46¼ -	.49¼
Tysonite*	lb.	.24 -	.24¼

SOLVENTS

Acetone (dlvd.)	lb.	.07 -	.10
Amsco Lactol Spirits* (t.c.)	gal.	—— -	.19
Naphthol Spirits*	gal.	—— -	.18
Mineral Spirits*	gal.	—— -	.17
Rubber Solvent* (t.c.)	gal.	—— -	.18
Solv A* (t.c.)	gal.	—— -	.24½
Solv A-80* (t.c.)	gal.	—— -	.30
Solv B* (t.c.)	gal.	—— -	.28½
Solv B-90* (t.c.)	gal.	—— -	.32
Solv D* (t.c.)	gal.	—— -	.30
Solv E*	gal.	—— -	.30
Solv F*	gal.	—— -	.30
Solv F-80*	gal.	—— -	.32½
Solv G*	gal.	—— -	.42½
Special Naphtholite* (t.c.)	gal.	—— -	.18
Special Textile Spirits*	gal.	—— -	.19
Super Hi-Flash Naphtha*	gal.	—— -	.35
Super Naphtholite*	gal.	—— -	.18
Textile Spirits* (t.c.)	gal.	—— -	.19
Amyl Chlorides, Mixed (t.c.l.) (dms.)	lb.	.09¼ -	.10¼
Benzol 90%	gal.	.36 -	.40
Butyl Acetate (t.c.)	lb.	.15 -	.16
Butyl Alcohol (t.c.)	lb.	.15 -	.16
Secondary (dlvd.)	lb.	.14 -	.15
Tertiary (dlvd.)	lb.	.14½ -	.15½
Carbon Bisulfide, Tech.	lb.	.05½ -	.07½
Carbon Tetrachloride	lb.	.09½ -	.12¾
Cosol 1*	gal.	.37 -	.43
2*	gal.	.42 -	.48
Cyclohexane	gal.	.55 -	.72
85% (c.l.) (dms.)	gal.	—— -	.54
Cyclohexanone	lb.	.32 -	.35
Diacetone, Pure (dlvd.)	lb.	.15 -	.16
Dichlorethyl Ether (dms.)	lb.	.14½ -	.15
Formal (dms.)	lb.	.30¼ -	.31¼
Dichloropentane	lb.	.04¼ -	.14¾
Dicom*	gal.	—— -	.50
Halowax Oil*	lb.	.28 -	.41
Heptanes* (t.c.)	gal.	.19 -	.22
Hexanes (t.c.)	gal.	.19 -	.22
Isopropyl Alcohol, Ref. 99% (dlvd.)	gal.	.57 -	.64
Ether, Ref. (dlvd.)	lb.	.07½ -	.08½
Mersol*	gal.	.43 -	.75
Mesityl Oxide (dlvd.)	lb.	.14 -	.15
Methyl Acetone, Syn. (dms., dlvd.)	gal.	.57 -	.63
Methyl Chloride	lb.	—— -	.11½
Methyl Ethyl Ketone	lb.	.14 -	.15
Methyl Isobutyl Ketone (dlvd.)	lb.	.16 -	.17
Methylene Chloride	lb.	.11¼ -	.15
N-5 Pentane Mix* (t.c.)	gal.	—— -	.13½
N-6 Hexanes* (t.c.)	gal.	—— -	.14½
N-7 Hexanes* (t.c.)	gal.	—— -	.13½
Penetrell*	gal.	.40 -	.62
Perchlorethylene	lb.	—— -	.14
Petrolene* (t.c.)	gal.	—— -	.14125
Picolines, Alpha, Refined	lb.	.43½ -	.44
Mixed	lb.	.32½ -	.33
Proprietary Solvent (dms.)	gal.	.51 -	.72
Propyl Acetate (t.c., dlvd.)	lb.	—— -	.10¼
Alcohol (t.c., dlvd.)	lb.	—— -	.10
PT 150 Pine Solvent* (dms.)	gal.	—— -	.44
Pyridine, Refined	lb.	.74½ -	.75
Quinoline	lb.	.50 -	.54½
Rubber Solvent (t.c.)	gal.	—— -	.16
Rubsol (t.c.)	gal.	—— -	.12875
Skellysolve B (Hexanes)* (t.c.)	gal.	—— -	.158
C (Heptanes)* (t.c.)	gal.	—— -	.151
R (Rubber Solvent)*	gal.	—— -	1.29
Solvent, Crude, Light	gal.	.19 -	.28
Solvesso 100* (t.c.)	gal.	.33 -	.35
150 (t.c.)	gal.	.33 -	——
Sunny South DD Dipentine*	gal.	.40 -	.62
Sunny South DD Pine Oil*	lb.	.12¾ -	.14¼

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SOLVENTS (Cont'd)

Sunray*	gal.	.1140	.1600
Toluene (dms.)	gal.	—	.38
Toluol (t.c.)	gal.	.33	.35
Trichlorethane	lb.	.13	.13½
Trigiycol Dichloride	lb.	.63	.64
Union Thinner 1* (t.c.)	gal.	—	.172
5* (dms.)	gal.	—	.197
7* (t.c.)	gal.	—	.162
2-50 W Hi-Flash*	gal.	—	.41
Xylol	gal.	.34	.38

STABILIZING AGENTS (for Vinyl Resins)

Advastab No. 21*	lb.	1.00	1.08
50-LT*	lb.	3.20	3.35
BC-105*	lb.	.75	.80
E-6-B*	lb.	.80	.85
L Paste	lb.	.65	.70
X23-74*	lb.	.70	.80
X30-15*	lb.	.65	.75
XBZ-155*	lb.	.69	.74
XE-82*	lb.	.85	.95
Barca 10*	lb.	.75	.80
Barium Ricinoleate (BVS)	lb.	—	.70
Barium Stearate	lb.	.39	.44
Basic Silicate White Lead	lb.	.20¾	.21¼
Cadmium Ricinoleate	lb.	—	2.00
Calcium Ricinoleate	lb.	—	.55
Dutch Boy DS-207*	lb.	—	.54
Plumb-O-Sil A*	lb.	—	.29¾
B*	lb.	—	.31½
Tribase*	lb.	—	.26½
Dythal*	lb.	—	.39½
Ferro 182* (dms.)	lb.	.70	.76
200* (dms.)	lb.	1.33	1.43
203* (dms.)	lb.	.85	.95
541* (dms.)	lb.	.35½	.45½
541A* (dms.)	lb.	.81¾	.91¾
700* (dms.)	lb.	.48¾	.58¾
900* (dms.)	lb.	.90	1.00
903* (dms.)	lb.	.55	.65
909* (dms.)	lb.	.91	1.01
920*	lb.	—	.98
931* (dms.)	lb.	.75¾	.85¾
993* (dms.)	lb.	.89	.99
1203* (dms.)	lb.	1.30	1.40
1206* (dms.)	lb.	1.23	1.33
1820* (dms.)	lb.	.90	1.00
1825* (dms.)	lb.	1.00	1.10
Permyl A	lb.	.45	.55
Harshaw I-V-3*	lb.	—	.43
1-V-4*	lb.	—	.68
1-V-7*	lb.	—	.71
2-V-4*	lb.	—	.95
2-V-7*	lb.	—	1.10
2-V-8*	lb.	—	1.30
5-V-1*	lb.	—	.41
7-V-1*	lb.	—	.90
8-V-1*	lb.	—	1.20
8-V-5*	lb.	—	.80
8-V-100*	lb.	—	.89
9-V-1*	lb.	—	.81
12-V-5*	lb.	—	.75
24-V-1*	lb.	—	1.28
28-V-2*	lb.	—	1.18
128-V-5*	lb.	—	.86
Lithium Stearate	lb.	.57	.62
Fluffy	lb.	.47½	.70
Standard	lb.	.52½	.75
Metasap 613-A*	lb.	—	.69
613-B*	lb.	—	.84
613-C*	lb.	—	1.06
621*	lb.	—	.88
624*	lb.	—	.75
633*	lb.	—	.75
635*	lb.	—	.45
Modicol N*	lb.	.41½	.42½
S*	lb.	.30¾	.31¾
Sodium Silicates 41°/1:32	cwt.	1.00	2.10
Stabelan E*	lb.	1.35	1.50
XL*	lb.	.55	.65
HR-50*	lb.	.75	.90
HR Liquid*	lb.	.65	.75
HR Paste*	lb.	.85	.95
HR Powder*	lb.	.95	1.05
No. 110 Liquid	lb.	.65	.75
No. 115 Liquid	lb.	.85	.95
No. 120 Liquid	lb.	.65	.75
Stabilizer No. 3*	lb.	1.90	2.00
No. 42*	lb.	.83	.93
No. 52*	lb.	1.90	2.00
No. 89X*	lb.	.75	.80
No. 143*	lb.	.80	.90
BC-12*	lb.	.87	.95
B-5*	lb.	—	.70
CH-14*	lb.	—	.65
CH-20*	lb.	—	.65
E6B*	lb.	—	.95
E-49*	lb.	—	.60
E-98*	lb.	—	.55
G-1*	lb.	1.25	1.40
HR*	lb.	.85	.89
JCX*	lb.	—	.63
L*	lb.	—	.60
M*	lb.	.68	.70
OM-10*	lb.	—	1.95
OM-18*	lb.	—	3.25
PL*	lb.	.63	.65
SN*	lb.	—	.48
V-1-N*	lb.	—	.43
VL-3*	lb.	—	1.00
X1*	lb.	.87	.90
XV*	lb.	.92	.94
XX*	lb.	.58	.60
Staflex OY*	lb.	1.00	1.20
QXMA*	lb.	—	.70

STABILIZING AGENTS (Cont'd)

Stayrite 10*	lb.	.32	.37
P-10*	lb.	.39	.44
15*	lb.	.53	.58
20*	lb.	.37	.42
22*	lb.	1.30	1.34
25*	lb.	.35	.40
70*	lb.	.68	.70
71*	lb.	.88	.90
75*	lb.	.68	.70
76*	lb.	.58	.60
80*	lb.	.68	.70
90*	lb.	.68	.70
95*	lb.	.68	.70
229*	lb.	.45	.50
Vanstay L*	lb.	.33	.35
H.T.*	lb.	.90	.92
S*	lb.	.63	.65

STIFFENING AGENTS

Neozone*	lb.	—	.80
Polyac*	lb.	—	1.80
Processing Stiffener 710*	lb.	—	.88
Solvitose HDF, H, C-S, T, and E*	lb.	.22	.25
Versatil Gum 8-E*	lb.	.15	.19

SUN CHECKING AGENTS

Allied AA-1144*	lb.	.23	.24
AA-1177*	lb.	.15½	.16½
Antisol*	lb.	—	.23
Antisun* (Chipped)	lb.	.15½	.17½
(Slabbed)	lb.	.15	.17
Heliozone*	lb.	.30	.31
Microflake*	lb.	—	.24
NBC*	lb.	—	1.55
Ross Sunproofing Waxes*	lb.	—	.14
Sunolite*	lb.	.16	.22
127*	lb.	.16½	.20½
154*	lb.	.23	.25
Sunproof*	lb.	.31	.32
713*	lb.	.25	.26
Improved*	lb.	.25	.26
Super*	lb.	.40	.41
Jr.*	lb.	.20	.21
Tonox*	lb.	.52	.54

SURFACE ACTIVE AGENTS

Anhydrapent*	lb.	.56	.59
Anhydrol 6990*	lb.	.51	.56
6991*	lb.	.51	.56
Aquarex D*	lb.	—	.78
G*	lb.	—	.21
MDL*	lb.	—	.33
ME*	lb.	—	.80
NS*	lb.	—	.60
SMO*	lb.	—	.50
WAQ*	lb.	—	.22
Emulphor EL-620*	lb.	—	.40
EL-719*	lb.	—	.058
EL-870*	lb.	—	.055
Igepal CA-630	lb.	—	.29
CO-630	lb.	—	.29
CO-730	lb.	—	.29
CO-850*	lb.	—	.29
CO-880*	lb.	—	.29
Igepon CN-42*	lb.	—	.25
T-33*	lb.	—	.31
T-51*	lb.	—	.13½
T-77*	lb.	—	.49
Kessco 50201*	lb.	—	.43½
50203*	lb.	—	.44½
18201*	lb.	—	.38½
18203*	lb.	—	.36
Pluronic L62*	lb.	.33½	.39
L64*	lb.	.33½	.39
Sellogen Gel*	lb.	—	.12¾
Soybean Lecithin	lb.	.13	.17

TACKIFIERS

Amalgamator Z-4*	lb.	.32	.33
Arco 620-32B*	lb.	.20½	.21
716-30*	lb.	.18½	.19
1041-21*	lb.	.16½	.17
Bunaweld Polymer No. 780*	lb.	—	.24
No. 5514*	lb.	—	.35
Galex* (dms.)	lb.	.15¼	.18
Indopol H-300*	gal.	1.00	1.22
Koresin*	lb.	—	.95
Liquid Rubber Flux*	lb.	—	.14
Nacconal NRSF* (dlvd.)	lb.	.40½	.45
Nilox Resin* (c.l.)	cwt.	—	14.50
Resin V	lb.	—	.23½
Synthol*	lb.	—	.24¼
Tackifier 1041-21*	lb.	.16½	.17½
Vistac No. 1*	gal.	1.00	1.21
A*	lb.	.21½	.22¼
Zirex* (c.l.)	cwt.	—	14.75

THICKENERS (For Latex)

Alcogum AN-6*	lb.	—	.05
AN-10*	lb.	—	.08½
PA-10*	lb.	—	.12
Betanol* (dms.)	lb.	.70	.95
Gomme Labolene*	lb.	.45	.47
Good-rite K-702*	lb.	.34½	.35
K-704*	lb.	.21	.22
K-705*	lb.	.31	.32
K-707*	lb.	.18	.19
K-708*	lb.	.29	.30
K-710*	lb.	.15	.16
Modicol VD*	lb.	.13¾	.14¼
VE*	lb.	.13¾	.14¼
Polyco 296 BT*	lb.	.15	.16
296-N*	lb.	.15	.16
530*	lb.	.15	.16
Propylene Laurate (dms.)	lb.	.57	.82

THICKENERS (For Latex) (Cont'd)

Sodium Silicate, 41°/1:3.2	cwt.	1.00	2.10
Solvitose Series*	lb.	.22	.25

VULCANIZING AGENTS

Selenium

Vandex*	lb.	—	15.50

Sulfur

Aero Brand*	cwt.	—	2.40
Blackbird* (c.l.)	cwt.	—	2.85
Cloud* (c.l.)	cwt.	—	2.80
Crystex*	lb.	.19½	.23
Darex Dispersed Sulfur*	lb.	.14	.16
Devil A* (c.l.)	cwt.	—	2.40
Dispersed Sulfur	lb.	.14	.16
Insoluble Sulfur 60*	lb.	.12½	.13
Ko-Blend IS*	lb.	—	.39
Mist* (Wettable) (c.l.)	cwt.	—	4.00
Spider* (c.l.)	cwt.	—	2.80
Star* (c.l.)	cwt.	—	3.25
Sulfasan R*	lb.	—	1.50
Tire* (c.l.)	cwt.	—	2.40
Tube* (c.l.)	cwt.	—	3.25
Vultac 2*	lb.	.47	.49
3*	lb.	.51	.53

Tellurium

Telloy*	lb.	—	2.50

WETTING AGENTS

Advawet No. 10*	lb.	—	.20
No. 33*	lb.	—	.48
Aerosol 18*	lb.	—	.40
AY*	lb.	1.00	1.20
MA 80%*	lb.	.67	.72
OS*	lb.	.39	.45
OT 75% Aqueous*	lb.	.63	.68
OT 100%*	lb.	1.00	1.20
OT-B*	lb.	.85	1.05
Alrosal* (dms.)	lb.	—	.40
Alrosperse*	lb.	—	.18
Anhydrol 6990* and 6991*	lb.	.51	.56
Areskap 50*	lb.	.30	.38
Dry 100*	lb.	.60	.72
Aresket Dry 300*	lb.	.60	.72
Aresklene 375*	lb.	.42	.57
Armacs*	lb.	.28	.77
Arquads*	lb.	.42	.61
Emcol 5100* (dms.)	lb.	—	.31
Etho-Chemicals*	lb.	.26	.58
Ethomeen S/15*	lb.	.48	.50
T/15*	lb.	.46	.48
Kesco E-122* (dms.)	lb.	—	.45
18201*	lb.	—	.38½
Kreelon 8G* (dms.)	lb.	.26	.32
Kyro EO* (dms.)	lb.	—	.29½
Modicol N*	lb.	.41½	.42½
S*	lb.	.30¾	.31¾
Nacconol SL* (dlvd.)	lb.	.084	.10
60S* (dlvd.)	lb.	.19	.225
Naccosol A* (dlvd.)	lb.	—	.52
Orvus AB Granules*	lb.	.15¼	.16¼
Parnol*	lb.	.13	.18
Santomerse D*	lb.	.44	.65
S*	lb.	.13	.25
Selapon Gel*	lb.	—	.13
Sorapon SF-73*	lb.	—	.18
SF-78*	lb.	—	.30
Sorbit P*	lb.	—	.28
Soybean Lecithin	lb.	.13	.17
Stablex G*	lb.	.50	.90
Tergitol 4* (dms., dlvd.)	lb.	.32	.33
7* (dms., dlvd.)	lb.	.43	.44
O8* (dms., dlvd.)	lb.	.31	.32
P28* (dms., dlvd.)	lb.	.18½	.19
Trenamine W-30	lb.	—	.15
Vultamol*	lb.	—	.17½
Wetsit Conc.*	lb.	.25	.28

MISCELLANEOUS CHEMICALS

Aquesperse 30*	lb.	—	.11
Arcopel W-18*	lb.	.17	.19
Asbury Graphite*	lb.	.05	1.45
Copper Inhibitor X-872-L*	lb.	—	2.01
D-Tac*	lb.	—	.22
2-Ethyl Hexanol	lb.	.23¼	.24¼
Fura-Tone Resin 1226*	lb.	.41	.43
HB-20*	lb.	.15	.17
HB-40*	lb.	.19	.20
MODX*	lb.	.32½	.34½
BF*-13	lb.	—	.26½
Naccoate 65* (dms.)	lb.	1.20	1.23
80* (dms.)	lb.	1.20	1.23
100* (dms.)	lb.	1.30	1.33
200* (dms.)	lb.	2.00	2.03
300* (dms.)	lb.	3.50	3.53
Pari Resin 2457*	lb.	.04	.04½
2702*	lb.	.04	.04½
2718*	lb.	.04	.04½
Pigmented Filmite* (dlvd.)	lb.	.16¾	—
Resorcin, Tech.	lb.	.77½	.81½
Rio Resin*	lb.	.60	.62
Rongalite CX*	lb.	—	.21½
Sherosope F*	lb.	.15½	.17¾
F-455*	lb.	.13½	.15¾
L*	lb.	.14	.16¼
N*	lb.	.15	.17¾
T*	lb.	.16½	.18¾
Sublac Resin PX-5*	lb.	.23½	.24½
Sulfasan R*	lb.	—	1.50
Synpep*	lb.	.54	.60
Thiokol LP-2*	lb.	.96	1.06
LP-3, LP-32, LP-33*	lb.	.96	1.06
LP-8*	lb.	1.25	1.35
Tysonite*	lb.	.24	.24¼
VA-7*	lb.	.50	.60
Vanfre*	gal.	2.50	3.00

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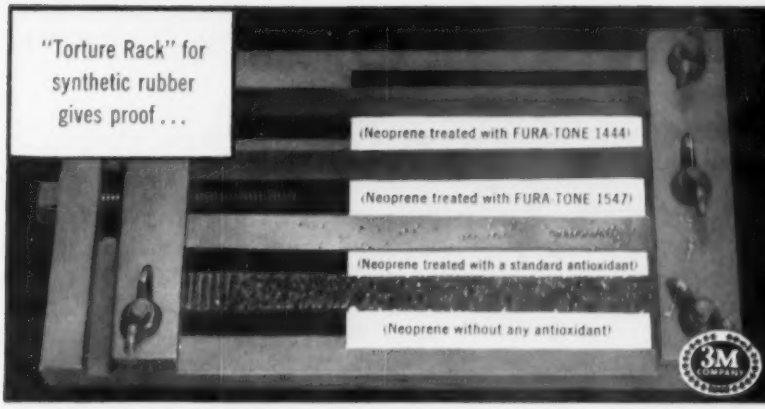
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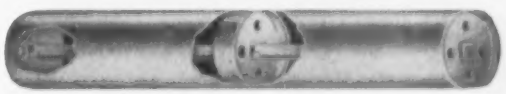

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"Help Wanted" continued on next page

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Lake Erie 215 Ton, 36″ x 36″ Platens, Self-contained, Semi-Automatic.
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Watson-Stillman 50 Ton, 12″ x 17″ Elec. Htd. Platens.
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Francis 40 Ton, 4 Opening, 12″ x 12″ Elec. Htd. Platens.
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Impco 22 oz. Model VF 8-22.
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Lester 12 oz. with Glengarry Weigh Feed.
Impco, 8 oz. Vertical Model VF-8, Late Model.
Reed Prentice 8 oz. late.
Reed Prentice 6 oz. late.
Watson-Stillman 6 oz.
Reed-Prentice 4 oz.
De Mattia 4 oz.
Watson-Stillman 4 oz.
HPM 2 oz. Manual Control.
NRK 2 oz. Hand Operated.
Watson-Stillman 2 oz.
Van Dorn, Model H-200, 1 oz. and 2 oz.

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Stokes S-5, 280-G, R-1, DD-2, RB-2, DDS-2, RD-4, G-4, RDS-3, R, T, & F
Colton #5½, #5, #2-RP and #3-RP, KUX 64.

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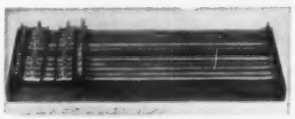

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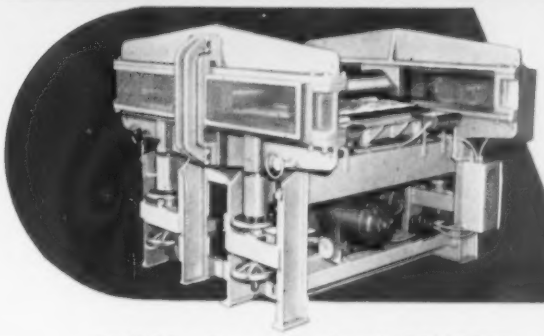

FEMCO ROLLER DIE CUTTER

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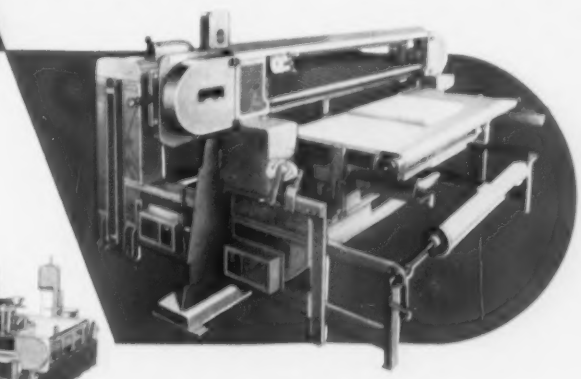
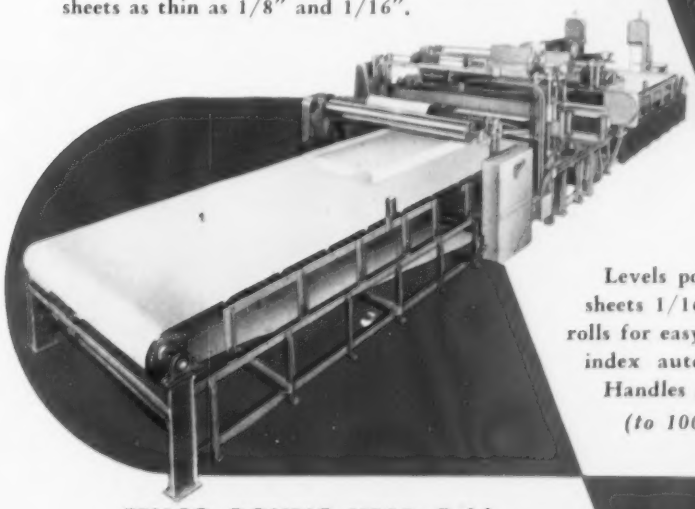


FEMCO Conveyorized SPLITTER

Splits synthetic foam and other materials from 9 to 26 feet per minute with gage accuracy. Splits roll stock up to 40″ in diameter; sheets and slabs to 75″ wide. Cuts sheets as thin as 1/8″ and 1/16″.



FEMCO DOUBLE HEAD Conveyorized SLAB LEVELER and SPLITTER

Levels polyurethane slabs; splits the stock into sheets 1/16″ thick, then winds the stock on two rolls for easy handling and shipping. Cutting heads index automatically to split desired thickness. Handles slabs to 84″ wide and to 25 feet long *(to 100 ft. long when conveyors are added).*

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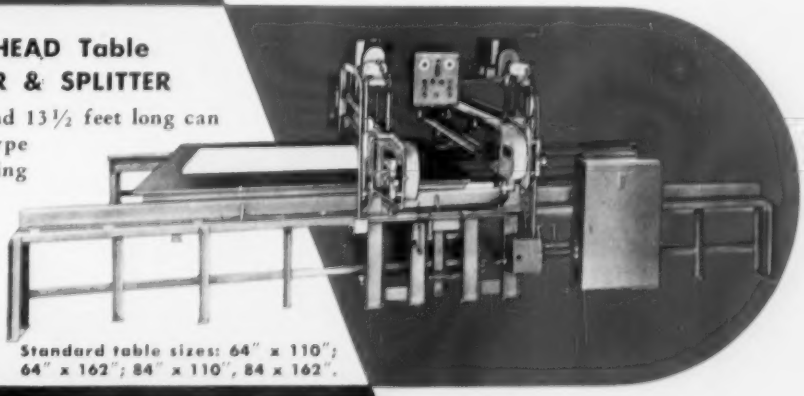
Slab stock up to 84″ wide and 13½ feet long can be handled on this table type machine. Twin indexing cutting heads double the production of single head model. Levels and splits stock to 1/8″ thick.



Standard table sizes: 64″ x 110″; 64″ x 162″; 84″ x 110″, 84 x 162″.

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SEPTEMBER, 1956

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Efficient Ultra Accelerators for Butyl Vulcanization

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